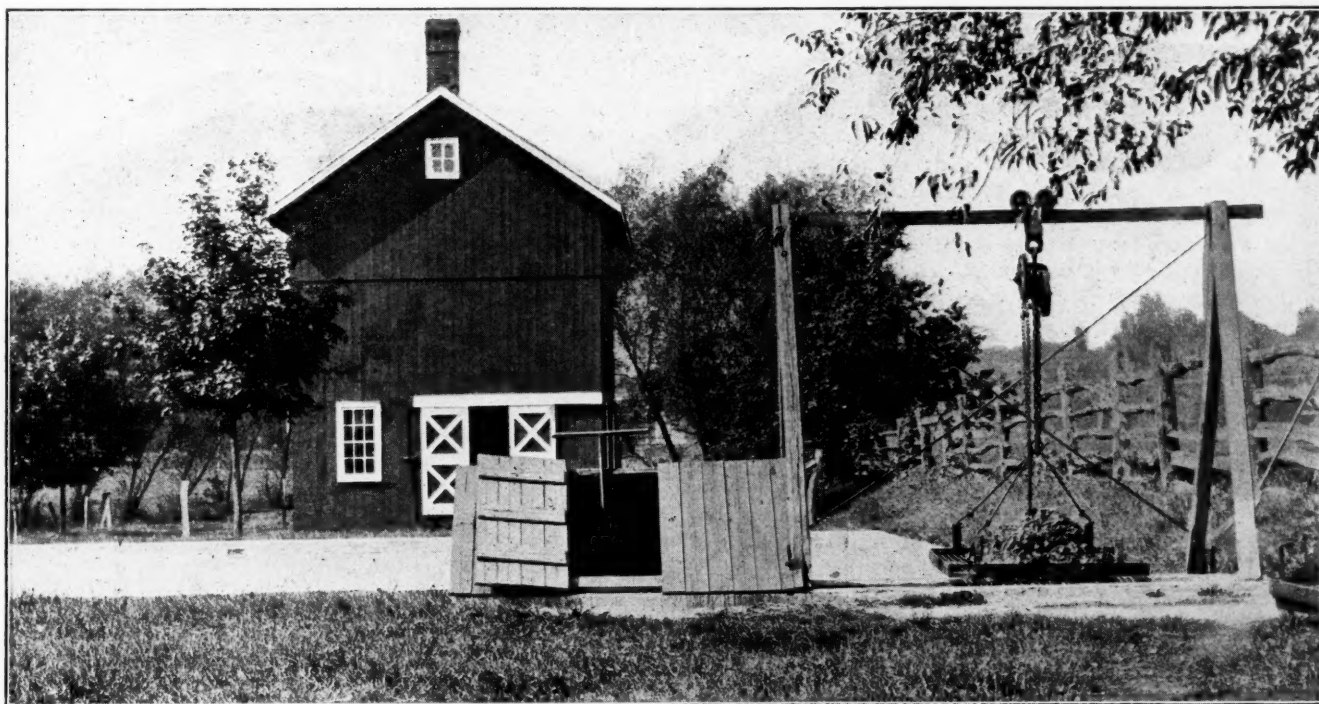


# Municipal Journal

Volume XXXVI

NEW YORK, JANUARY 15, 1914.

No. 3



A WEEK'S COLLECTION ON A HORIZONTAL SCREEN. TOP OF TANK AT LEFT.

## THE OPERATION OF SEWAGE DISPOSAL PLANTS

**Suggestions Based on Experience With Scores of Plants of Various Kinds—Operation More Important Than Design or Construction—Grit Chambers and Screens—Regular Frequent Cleaning Most Important**

BY FRANCIS E. DANIELS, A. M.\*

Dr. Thresh, medical officer of health for the county of Essex, England, in an address before the Association of Managers of Sewage Disposal Works, made a statement which has often been quoted as follows: "I have so repeatedly seen excellent works give bad results on account of inefficient management, and very defective works give fair results on account of the efficiency of the manager, that I have come to regard the manager as being even more important than the works." The truth of this statement has so frequently been brought to the writer's attention during his personal observation of the sewage disposal plants of the state of New Jersey that when the editor of the *Municipal Journal* requested him to write for publication his experiences with the operation of sewage disposal works, he decided to describe briefly the general principles to be considered by the man in charge of a sewage disposal plant, and to point out to him some of the things to do and some to be left undone. In addition he hopes to make plain, from the point of view of the operation, some defects in design or construction, with the idea of offering helpful sugges-

tions to the designing engineer. In this connection he wishes it to be known that his statements are for the purpose of aiding those who wish to profit by his experiences, and not for the purpose of criticising those who appear to have made a mistake. A designing engineer should not be surprised, however, if a plant receive unjust criticism, if he has put into it some new departure, the purpose of which is not likely to be understood and has quit the job without leaving a record of what he desires it to accomplish, or how he proposes his "invention" shall be operated.

Almost any human being will sooner or later do the wrong thing when an emergency arises if he has been working simply as a machine, without understanding the principles underlying his operations. For instance, the writer has known the chief engineer of a state institution to mix, for disinfection, the required number of pounds of hypochlorite in a tankful of water. The solution was allowed to settle and the clear liquor was drawn off and used. Instead of putting in a fresh quantity of hypochlorite for a new solution he merely filled the tank with water, because, as he said, there was plenty of "lime" left in the bottom. So there was, plenty of

\*Director of Water and Sewerage Inspection, Bureau of Food, Drugs, Water and Sewerage, Board of Health of the State of New Jersey.

inert lime, but the active hypochlorite had all been dissolved and drawn off the first day, so that no disinfection was obtained after that time until nearly a month later, when the facts were brought to the writer's attention, although the tank had been filled and emptied daily in a purely perfunctory way. On the other hand the writer once knew an old Irishman who had been a faithful plant attendant for one of our New Jersey towns for sixteen years. This old man could neither read nor write and his ideas on many subjects were decidedly primitive, but he had an excellent understanding of the whys and wherefores of his particular plant, and kept everything in a fine and tidy shape, free from nuisance, and with proper alternation of flow on the beds.

We need in immediate charge of every sewage disposal works an intelligent man who thoroughly understands the fundamental principles of sewage disposal and who is personally familiar with every detail of his particular plant. He must *know* when every unit is performing its functions properly and what to do in case of emergency. He must be able to tell when his tanks are beginning to let over an undue amount of suspended matter, indicating that a removal of stored up sludge is desirable or necessary. He must know when his various forms of feed or dosing apparatus are working properly, and how to make proper adjustments as soon as a siphon or other apparatus gets out of order. In one of his rounds the writer discovered a suspicious appearance at the outlet of one of four contact beds. The attendant assured him that each bed was working perfectly as he had been at the plant daily for weeks. Upon close investigation the writer found that the discharge siphon in the bed noted was out of order so that at every round this bed did not hold but allowed the dose to run right through without any purification. This had been going on for weeks, almost undoing the work of the other three beds, which were turning out a good effluent, and the attendant was none the wiser.

In order to get the highest efficiency from our sewage disposal plants as they now exist, the attendants must be taught the necessary fundamentals or be displaced by specially trained men. Many a plant when new does not appear to require skilled attention because it is usually of such a size that a future growth of the town for which it was built has been provided for and, therefore, the duty imposed upon the treatment units is comparatively light. The final effluent of such a plant is usually excellent, although in many cases the writer has seen this produced almost wholly by the final sand filters because the preliminary treatment units or the contact beds had not been operated so as to perform their share of the work. Sooner or later such a plant becomes more heavily loaded and then trouble begins and corrective measures are oftentimes costly.

On the other hand, we have a sewage plant in the state of New Jersey which has been so overloaded for years that in the hands of an ordinary attendant it would have long since become a menace to health and a public nuisance; but a laboratory is maintained at the works and the plant is under the constant personal supervision of a specially trained man. By this means it has been possible to prevent the plant from becoming a nuisance and to have it turn out a very fair effluent in order to tide over the delay in rebuilding, due to financial and legal difficulties.

If the plant attendants of any state or section of country would unite themselves into an association for the purpose of discussing daily practical problems and interchanging ideas on subjects dealing with sewage disposal, I believe much mutual benefit could be secured. Such an association exists in England and much helpful information is acquired at the meetings, both from the

papers presented and in the informal discussions of the various problems arising at the different installations.

The general public and even town officials have no conception whatever of the variety of subjects with which a successful plant superintendent should be acquainted. Raikes in his book, *Sewage Disposal Works*, says: "The proper technical training of a competent manager is therefore a gradual process, since it should include both a theoretical and practical knowledge of the whole sewage disposal problem, which can only be gained by constantly reading all available literature on the subject, and carefully studying different types of sewage works in actual operation; but in addition to this, he should possess some knowledge of agriculture, chemistry and bacteriology, as well as hydraulic and mechanical engineering, before he can be considered technically qualified to undertake the control of the costly works now required for purifying the sewage from our large towns.

"It can hardly be expected, however, that the sewage works of small communities should receive the undivided attention of a fully qualified manager, and in such cases the difficulty arising through the inability of a partially trained man to take full responsibility may be largely overcome by appointing a competent consulting specialist to exercise a general control of the works, who would make periodical inspections, and whose experience would enable him to advise as to the best means of checking any tendency to deterioration which he might detect, either in the works themselves or the quality of the effluent, thus preventing the permanent damage which would otherwise ensue and ultimately involve considerable expense to rectify.

"A similar course might also be adopted with advantage in the case of many larger communities where difficulties frequently arise through local authorities expecting their surveyor to undertake the whole responsibility involved by the maintenance of sewage works in addition to all the other duties of his office, which may be more than sufficient to occupy his full time and attention; and by occasionally obtaining the opinion of a specialist, who would emphasize the importance of improved methods or any structural alterations necessary, the disastrous results of false economy might be averted to the mutual benefit of all concerned."

The Board of Health of the State of New Jersey endeavors, in its supervision of the sewage disposal plants, to instruct the plant attendants as much as the present facilities will permit; but it is impossible for such a central body to detail men to remain at the works long enough so to instruct the men in charge that they will be prepared for every emergency which may arise. There is, therefore, right in our state as well as elsewhere, a field for the "traveling expert" such as Raikes refers to above. This consulting specialist could have a circuit of plants to care for and he would have opportunity of remaining at each one long enough to learn fully the local conditions; and by frequent and extended tests and records he would, with the help of the local attendants, be in a position to keep each unit up to its requirements, to have the final effluent as satisfactory as possible, and to give valuable advice in regard to changes or improvements. That men fully qualified for this kind of occupation are available the writer knows, because some of them have expressed to him their desire to go into just such work.

If in the succeeding pages of this discussion the writer shall set forth any information which will be of benefit to the plant attendant who is not an expert, but one who is conscientiously striving to do his utmost to produce satisfactory results and endeavoring to overcome his difficulties, he will feel that his efforts have not been



wholly wasted. The plan of the discussion will be from the point of view of a complete modern sewage treatment plant; taking up the various units and processes step by step from the sewer outfall to the point of final discharge of the effluent. Furthermore, only plants receiving sewage from sanitary systems on the separate plan will be considered because the operation of works handling sanitary and storm water sewage combined is somewhat different and not so generally applicable to the American practice.

#### GRIT CHAMBERS.

Grit chambers are usually small tanks through which the sewage flows immediately upon leaving the outfall before entering the treatment works proper. The purpose of these chambers is to remove sand and the heavier mineral matters which by themselves are inoffensive to the senses and not capable of being worked over by the subsequent biological processes, but which are highly undesirable in either tanks or contact beds because of the space taken up and the difficulty of removal. Grit chambers are not intended to retain sludge or other decomposable organic matters.

The usual method of obtaining the results desired is to adjust the size and shape of the grit chamber to the sewage flow so that the velocity of the sewage passing through the chamber will be slow enough to allow the grit to settle and yet fast enough to carry through the organic matters. This may or may not be easy. With a system of tight sewers and only the hourly, daily or seasonal variations of flow the problem is not so difficult; but with a system of leaky sewers and uncertain flow fluctuation, it is almost impossible to have a grit chamber which will not at times hold back putrefactive matters and at other times allow sand and grit to escape unless it is given the utmost watchfulness and attention. While grit chambers may not be necessary or even desirable on some of our better constructed sanitary sewerage systems, they are on others quite advantageous if properly designed and properly cared for. We have in some of our New Jersey towns sewerage systems from which in time of storm it is impossible to keep out sand and detritus. At the inlet end of one of our so-called septic tanks after only a few weeks' run the writer found a deposit of sand and heavy mud, several feet wide, extending across the tank and nearly up to the flow line. There must have been several cubic yards of this material so tightly packed that it was difficult to get a rake down into the mass. Since this deposit had gone into the tank and had to be removed through manholes in the cover the writer advised the installation of a grit chamber and such other measures as could be taken to keep out of the sewers as much sand as possible, to prevent a continuance of this performance.

The duty of the plant attendant in regard to grit chambers is to give them *frequent* attention. Remove the contents often enough to prevent the possibility of grit being washed out, and in some cases it will be necessary to clean these chambers out every little while to prevent local nuisance.

At one of our plants there existed a large double grit chamber which was cleaned out several times a year, yet in summer this was the source of sufficient disagreeable odor to create a considerable nuisance in the neighborhood. Although the size was so great that considerable organic matter was detained, yet it would hardly have been safe to have made the chamber smaller because at times of showers, when most of the grit came in, the increased flow of sewage would have washed the sand through the chamber and into the septic tank.

In this case more attention should have been paid to the sewer system to prevent the entrance of storm water. Low manholes should have been raised and at some

points where the street grade would not permit a manhole sufficiently high to keep out storm water, tight covers should have been sealed on and sewer ventilation provided for in other ways. Too little attention is still being given to the construction of tight joints in sewer lines and to the prevention of the entrance of storm water into sanitary sewerage systems which takes in with it entirely too much sand and dirt.

Grit chambers are and should always be built in duplicate so that the process of cleaning can go on without interrupting the sewage flow. In the large installations dredging apparatus is used to remove the sediment; while at the smaller plants, and usually at those not handling storm sewage, the contents of the grit chambers are taken out by shoveling. The material removed can usually be dumped into some low place or spread out on the ground at a point where it is not likely to cause nuisance. If, however, it is foul with organic matter it had best be buried or disposed of along with the tank sludge. As screens are often placed at the outlets of these chambers, they are thereby converted into combination grit and screen chambers. Only one plant of the 130 now in operation in the State of New Jersey has a bona fide grit chamber; all others having appurtenances of this kind arrest the sand in the screen chambers.

#### SCREENS.

In regard to the screen the first question the attendant must ask is, What is it there for? or what is it supposed to do? Having asked the question, then let him find the answer; because, before he can manage the screen intelligently he must understand thoroughly the purpose for which it was installed.

The purpose of a screen may be one of many, depending not so much upon what comes down the sewer, for that is legion, as upon the processes which follow. They may be used to remove such things as would break or cause stoppages in the pumps; or to arrest a large amount of suspended matters which would cause undue clogging on filtering areas; or to remove light suspended matters which would cause excessive formation of scum in septic or settling tanks (the use of fine screens will entirely prevent the formation of tank scum); or to remove such a large proportion of the suspended matters that only a clarified liquid remains to be discharged or disinfected.

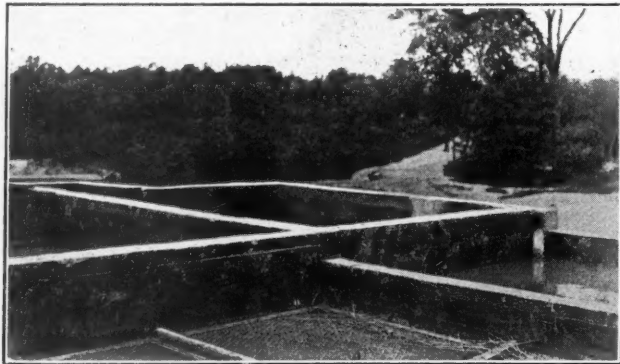
Coarse screens are usually bar screens or gratings. These are made of wooden slats or iron bars or rods set in a frame. They are made either stationary, or movable so that they can be hoisted up for cleaning, and are placed in a vertical, inclined, or horizontal position. Probably the best are the stationary bar types inclined down stream at an angle of about 30 degrees or more with the vertical. These may easily be cleaned by means of hand rakes. The vertical ones are sometimes cleaned with rakes while in position, or sometimes they are hoisted out, cleaned off and replaced. The horizontal ones are often more or less in the form of baskets which are hoisted out for cleaning.

Fine screens are usually of woven wire, and by reason of the nature of construction are difficult of being properly cleaned, some of the larger revolving types requiring a constant playing of jets of water to keep the meshes clear.

Perforated metal sheets have been suggested for use as sewage screens so that cleaning could be done by means of a hand squeegee. The writer has not had any personal experience with this kind of screen except in one instance. In this case the screen consisted of a flat sheet of iron perforated by holes nearly one inch in diameter. This sheet was placed in a horizontal position over the receiving compartment of the settling tank and up against the bottom of the sewer outlet, so that the

sewage solids from the institution soon piled up around the mouth of the sewer. The first time the attendant forgot to clean off the screen the stoppage continued up the sewer and the water closet in the basement of the building overflowed. The plumber had then to be sent for to clear out the sewer line. The trouble in this case, however, was due not so much to the perforated metal as to lack of forethought. The writer has seen exactly similar instances in manholes, into which side connections have been brought through the wall just above the flat bench or bottom. All solids of any considerable size stranded upon the flat surfaces and complete stoppage of the branch sewers resulted.

Occasionally the writer meets designers who advocate



STRAW SCREENS AT LAKEWOOD.

and wish to install upward flow screens or filtering materials into which the flow enters from beneath, the claim being that the screenings will, after being intercepted by the obstruction, fall back into the screen pit. This the writer can hardly vouch for because he has not seen it happen. The general testimony is, however, that the screenings stick and are in a position not readily accessible.

The only upward screens in use in New Jersey are at Lakewood. These consist of two frames of coarsely woven wire, between which is placed a layer of straw or salt hay. This strains the sewage quite effectively if properly cared for, but requires close attention and frequent renewal. An objection is that, in addition to the material removed from the sewage, the accumulation of the used hay must be removed and disposed of. Further-

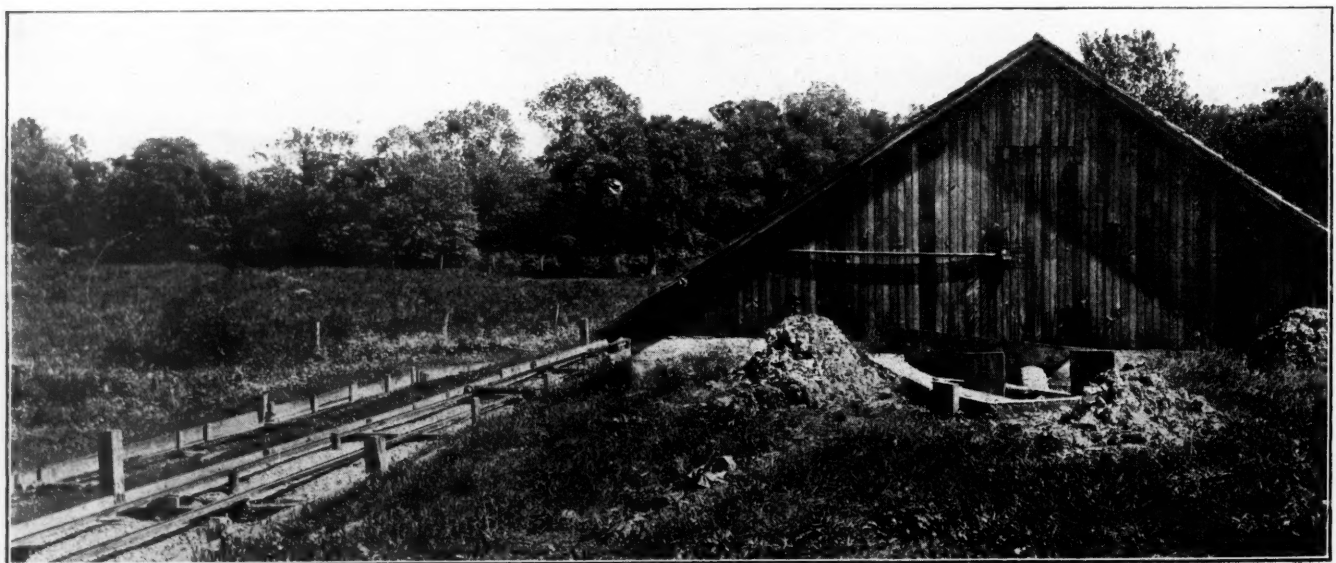
more the upward pressure often breaks holes through the layer and then a considerable flow of sewage passes unscreened.

In regard to the actual management of screens, the fundamental principle is to assist each to perform its proper function and to see that the proper result is obtained. This will usually require daily attention, although in some plants at times the screens have to be cleaned several times a day. Probably the ideal plan is to have some economical mechanical appliance to be constantly at work removing the screenings as fast as they accumulate. Such ingenious and elaborate mechanical screening devices as are in use in Germany and England require special instruction in regard to operation. There are some types of mechanical screens in this country, notably the one at Reading, Pa. In this one the sewage passes through a wire cloth of 40 meshes to the inch, which is kept clean by means of jets of water. At the time of the writer's visit the installation was performing good service. However, he has been informed that upon a recent tour of inspection made by a man in the middle west it happened that of the mechanical screens visited in the United States and Canada not one was found in operation. He only mentions this to show that all of the difficulties in this direction have not yet been satisfactorily overcome.

The writer does not believe it is wise to allow the screens to hold back organic matter which could be better taken care of in the tank. This will not happen with a properly designed apparatus if the screenings are removed often, nor will there be danger of overflows or deposits in the outfall due to backing up of the sewage.

The attendant should be very careful to keep the premises around his screens tidy and cleanly. Screenings should be removed as soon as possible and not allowed to accumulate so as to cause nuisance. They may be buried or composted with lime or otherwise disposed of according to local conditions.

The writer would like here to call the attention of those concerned to the danger of infection from fresh sewage material, such as may be removed from screen chambers. Some of it may, and probably does, contain disease germs, which are still in a very vigorous state. This material should never be carted through streets in open or leaky vessels, nor left exposed in places accessible to flies and domestic animals. The attendant should exercise the utmost care to prevent infecting his food



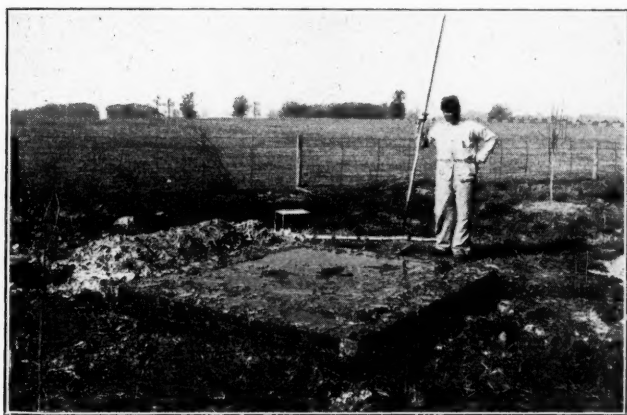
SCREENINGS ALLOWED TO ACCUMULATE AROUND SCREEN PIT.  
At left foreground, trickling filters with distributing troughs.



and drink or transporting infection to his household. He should also be careful of cuts or abrasions upon his person while handling this kind of material.

The care to be taken of the screen chamber is also an important part of the attendant's daily duties, and the design of the chamber plays an important part in the screening process. If grit and detritus are arrested in the screen chamber then it must be cleaned out at frequent and regular intervals. For various reasons the cross-section of the screen chamber must be greater than the cross-section of the sewer; but if the chamber be too large, an undue amount of organic matter will be retained which would be better taken care of in the tanks. This has to be removed, usually by letting it flow upon the sludge bed, and it forms an offensive sludge which is somewhat difficult to handle.

At one of our towns a fifteen-inch outfall sewer empties into a screen chamber some 10 feet by 12 feet in plan,



SCREEN PIT OVERFLOWING THROUGH OMISSION OF CLEANING.

separated into two units by a dividing wall, and 8 feet deep to the bottom of the screens. Each unit then tapers into a conical pit to a depth of 6 feet further down. The screens are  $4\frac{1}{2}$  feet wide by 8 feet deep, and consist of bars  $\frac{3}{8}$ -inch wide, spaced  $1\frac{1}{4}$  inches apart in the first set and  $\frac{5}{8}$ -inch apart in the second. On account of the low velocity of the sewage, this chamber fills up in a short time with a mass of grit and putrefying organic matter. An attempt to get the fine material over into the septic tank by churning it up was without success. The only thing to be done in this case is to keep the screens free from rags and the larger matter and draw off the sludge upon the sludge bed whenever necessary.

The placing of a horizontal screen and pit under the direct discharge of a sewer outfall carrying a stale sewage in one of our plants was the cause of such a local nuisance from odors that the screen had to be removed and the sewer connected directly to the pumps. The sewage is now pumped into the septic tank without odors or local nuisance. When the screens were in use at certain times in the year they had to be cleaned off every few minutes.

The writer recently visited a plant and found conditions such that he advised the attendant *not* to clean the screen until it became necessary. The plant was a disinfection plant and the sewage passed through bar screens before entering the disinfection tank. There was no danger of backing up the flow into the sewers, nor of local nuisance from odors, and the screen had not been cleaned, probably, for months. Feces and other matters were being held back by the screen and digested so that a much clearer liquid was obtained to be acted on by the hypochlorite, and for this reason the disinfecting action was much more complete than would have been the case had the screen been cleaned daily.

### SEWER MAINTENANCE IN WORCESTER.

In Worcester, Mass., most of the cleaning of sewers is done in the winter months, as at this time construction and repair work are lightest. At the end of the last fiscal year the sewer system included 213,087 miles of sewers, 7,528 manholes and 3,413 catch basins. During the year 724 cubic yards of grit were removed from the sewers. In the case of large sewers this is removed by laying a sectional track from the nearest manhole, carrying over the track to this manhole pails filled with the silt and hoisting them to the surface. In the smaller sewers scrapers are pulled through by men, horses or hoisting engines, as circumstances may require.

During the year 6,783 catch basins were cleaned, an average of practically two cleanings to each basin in service; 17,364 cubic yards of street washings were removed from the basins and carted to the nearest available dump. This gives an average amount of material removed at each cleaning of 2.56 cubic yards. The cost of removing this material averaged 83 cents per cubic yard, or \$2.13 per cleaning.

The cost of cleaning sewers was \$29,745, or \$131.59 per mile of sewer in service. The cost per mile has remained fairly constant for the past thirty-five years, the minimum during that time having been \$110.47 and the maximum \$203.84; but during the majority of years the cost per mile ranged between \$120 and \$175.

### UTILIZATION OF SEWAGE SLUDGE.

Several cities in California have recently had presented to them a proposition by a private company to not only dispose of their garbage without cost, but actually to pay the cities for the garbage delivered at the company's plant, and also to treat the sewage without expense to the city. The company in question appears to have financial backing, and expressed its willingness to put itself under bonds to carry out this contract. Such a contract has been made with Los Angeles, and we believe the plans for the plant are now under way. A similar proposition was made to a combination of cities, with the idea that they should unite in a common intercepting and outfall sewer which would conduct the sewage to one disposal plant and, we understand, would arrange to have the garbage also all sent to a single plant.

The garbage disposal plant which the company making these propositions—the Pacific Reduction Company—proposes to employ is, we understand, to be modeled largely after the one which has been used successfully by the city of Cleveland for a number of years. More novel is the method by which the company proposes to treat the sewage. The plan in general may be described as follows:

The sewage passes first through a revolving elevating screen made of wire rope with angle iron separators, by which floating solids and large particles are removed and dumped onto a belt conveyor which carries them to a pulverizer, which redeposits them into the sewage. Provision is made for preventing the escape of odors from this portion of the plant. The sewage is then treated with chemicals (probably lime), and flows into a series of sedimentation tanks which are of sufficient size to give eight hours' retention in the tank and are divided into sections by baffle walls. The object of the baffles is to provide a thorough intermingling of chemical with the sewage and to prevent the formation of surface scum. Some special features are referred to, such as having the sewage, in flowing from the tank, pass over weirs in order to provide for absorption of oxygen from the air; the covering of the building "to protect the sewage from the influences of the sun's rays,"

etc. The effluent is to be further purified by some process not stated, although the electrolytic process is referred to. The sludge is drawn off from the sedimentation tanks to a pump well, from which a centrifugal pump delivers it to storage tanks. From these tanks it is drawn and forced into filter presses, presumably of the regulation type which have been used for years. During the pressing, steam is supplied for the purpose of releasing the grease, which flows off with the filter water and is collected in skimming tanks, the overflow from the tanks being returned for further treatment.

At this point the real novelty of the plan begins. The sludge is used for making producer gas, the process being described as follows: While the ordinary method of drying sludge has been to drive off the moisture as steam, driving off moisture does not require a temperature of 212 degrees Fahrenheit, but may be secured by subjecting it to large volumes of dry air at much lower temperatures, and much less heat is thus lost up the chimney. "The dryer is of the revolving type and partially enclosed in concrete walls lined with fire brick. Ample areas are provided for the circulation of heated air around the exterior and into the interior of the shell, so that the first value of heat is employed to heat the shell and the second value in heating the air which passes through the dryer in direct contact with the substance drying. The furnace and combustion chamber occupy the lower portion of the enclosed part. An arch extends from the furnace wall to the rear end of the combustion chamber, and the dryer is above the arch. Air inlets are located near the floor of the combustion chamber, and induced draft is developed by power fans, which produces the circulation and discharges the vapors into a condensing chamber. The gases enter the dryer at a temperature ranging between 1,000 and 1,200 degrees Fahrenheit. They follow the course of circulation, mingling and mixing with the air that is supplied to increase the volume, thus utilizing what would otherwise be discharged into the atmosphere. The second application of heat is at low temperatures, as the grease volatilizes at about 490 degrees Fahrenheit, and it can readily be seen how a safe maximum temperature can be maintained by increasing or decreasing the volume of air by controlling the speed of the blower.

"The dry residual matter is deposited by the dryer into a boot of an elevator, which delivers it into storage bins situated above the gas producers." In the condensing chamber referred to, which is connected with the dryer, are baffle walls which cause the gases to pass in a gyratory manner and atomizers which produce a water spray passing downward through the chamber. "The vapors which leave the dryer contain grease, ammonia and carbon dioxide; the heavier are thrown down by the spray, collected and delivered to the storage vats by a pump. The grease is removed and the liquor discharged into the sewage tanks. The light or uncondensed gases are either consumed under the boiler or in the gas producers; or they can be discharged into the atmosphere, as they have been thoroughly cleansed.

"The character of the sludge has undergone a great change by the previous treatment and is converted into fuel, the thermal value being equal to many lignites, tan bark, or sawdust, an ideal material for fuel for a gas producer. The thermal value of sludge was early recognized, but the large percentage of ash prevented its use as fuel for the production of gas. The solution to this problem has been made by the type of gas producers, which are of the revolving hearth type and automatic in action. The mechanism is so designed as to have positive control of the ash discharged. Automatic feed

supplies the producer with such amounts of fuel as correspond with the fuel consumption per square foot of grate surface. The gas flows from the producers into the washers, where the impurities are removed, and continues on to the holder." (Part of this gas is used for supplying the heat employed in the dryer.) "The gas washers are of the centrifugal type, known as the Feld washer. These washers have given splendid service in England and Germany, and have been adopted as being the most efficient." Ammonia is recovered as a sulphate at a point between the gas washers and the holder, while the gas is in transit. The ashes from the gas producer are said by the company to form an excellent base for fertilizer.

## SEWAGE PUMPING AT PLAINFIELD

### Four Plants Consisting of Air Compressors, Electric Motor Driven, and Ejectors—Method of Operation—Cost of Current.

The larger part of the sewers of Plainfield, N. J., drain to disposal works at the westerly end of the city, and many of the sewers are laid on minimum grades in order to reach the works. Around the southeasterly and southerly sides of the city there is an area too low to reach the works by gravity. A sewer to drain this area could have been constructed with but one pumping station near the disposal works, but the sewer would have been mostly in fine sand, about twenty feet deep and from four to eleven feet below the ground water level.

On this account, four pumping stations and one temporary station have been planned to care for this low section. All but one of these have been constructed and are in operation, and the fourth is now being planned by George W. Fuller to provide for the remaining section of the city not now sewer'd. As planned, this station will be located at the disposal works and will be equipped with motor-driven centrifugal pumps.

The first pumping plant was constructed at Randolph Road in 1908 and consisted of Latta-Martin pumps or ejectors, Ingersoll-Rand 10x6-in. air compressors run at 187 revolutions per minute and Wagner 7½-horsepower, 220-volt, single-phase, induction motors. These motors operate as repulsion motors during the starting period.

The above mentioned machinery is in duplicate and there is also a Fairbanks 7½-horsepower gasoline engine which can be belt-connected to either of the compressors.

There are two 50-gallon pots to each ejector, operated by floats, walking beam and series of valves for admission of air. When in operation, a pot discharges every 12 seconds, making a capacity of 250 gallons per minute for each pump.

At this and also at the other two main stations the motors are automatically started and stopped by floats rising and falling with the sewage in receiving wells, a storage of from 2,500 to 5,000 gallons being available, so that the plants rest part of the time and work at full capacity the remainder of the time. Cutler-Hammer sump switches are used.

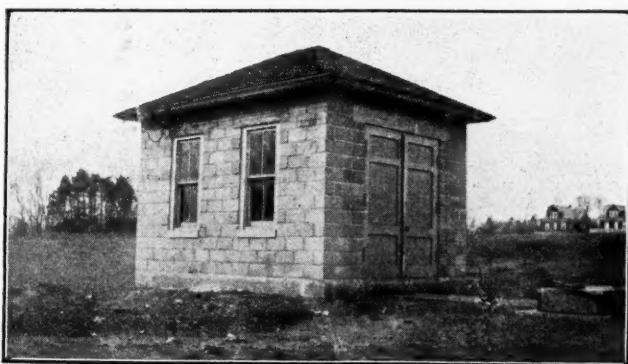
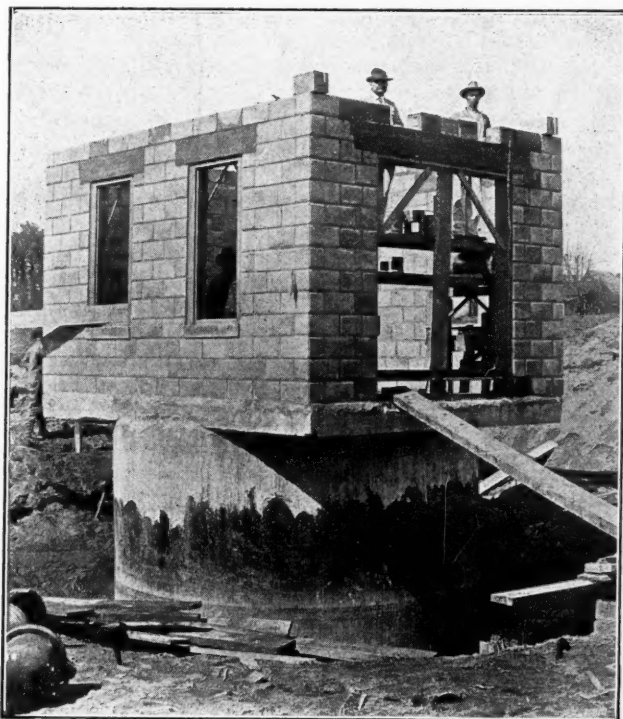
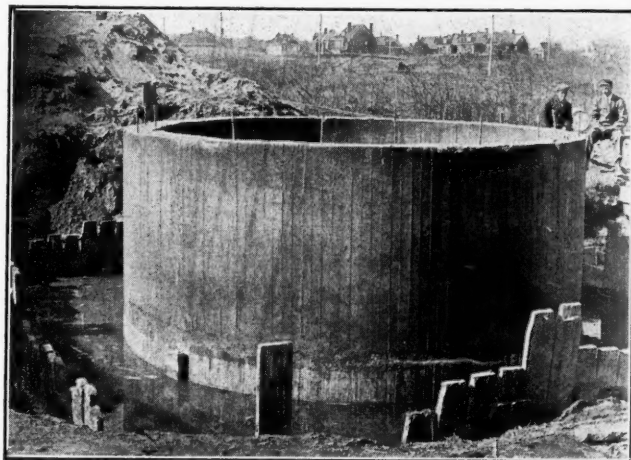
The plant has proved satisfactory except that the valve mechanism of the ejectors needs to be taken apart and cleaned two or three times a year (about 2 days' work each time) and some of the small pins have to be renewed.

A small temporary pumping station is located near the Randolph Road station and the equipment consists of two Blaisdell 50-gallon ejectors operated by air from the Randolph Road station. The operation is controlled by floats in the ejectors and the plant has never given any



trouble. A 2-inch wrought iron air main 1,778 feet long connects the two stations.

The Randolph Road plant, besides furnishing the air above mentioned, pumps an average of about 2,500 gallons per kilowatt hour, to a height (from lower discharge level of ejectors) of 16 feet, through an 8-inch force main which rises for 1,900 feet, falls 0.4 foot in the next 300 feet and then runs level 300 feet to the main sewer, into which it discharges. There are three right angle bends,



MONROE AVE. PUMPING STATION, PLAINFIELD, N. J.

on the force main and several bends and 4-inch pipes at the ejectors, which add to the friction head. The pressure in air receiver is about ten pounds. A screen with half-inch bars and 2½-inch openings is used here, but no screens are used at the other stations. It is mainly on account of being able to dispense with screening that ejectors are used instead of centrifugal pumps, as these pumping stations are located in sections where a good class of dwellings is being erected and planned for. In order to make them as unobjectionable as possible, the latter buildings are constructed of concrete blocks, with double doors, and, being set back about 75 feet from the street, they have the general appearance of small garages.

The stations at Monroe and Huntington avenues are similar to each other except that at the latter station, which only serves a few houses at present, a two-phase current was available. Each of these plants consists of two Blaisdell 150-gallon ejectors, two Blaisdell air compressors, two Wagner motors, Blaisdell pilot and operating valves, Sundh switchboard, etc. The motors in use are 5-horsepower and the compressors are 7x5-inch, 200 revolutions per minute, silent chain drive. These plants were installed by the Blaisdell Machinery Company of New York and Bradford, Pa., but the method of governing the admission of compressed air has been somewhat changed. The floats have been taken out of the ejectors and the pilot valves moved to the machinery floor, where they are operated by belt connections from the shafts of the air compressors. The operation of the valves is timed so that one pot empties about as fast as the other fills.

The exhaust air from the ejectors is supplied to the compressors during a part of the cycle, a check valve admitting free air during the remainder of the time. When operating in this way, under a pressure of about 12 pounds, the plant raises 3,500 gallons per kilowatt hour to a height of 20 feet (from the bottom of the ejectors) through an 8-inch force main 1,840 feet long, with three right-angle bends. The present method of operation was planned by Assistant Raymond L. Bonham.

The ejector pots are placed in circular concrete wells, 12 and 13 feet in diameter and from 14 to 18 feet deep, the top of the pots being about level with invert of sewer. The motors, compressors, switch board, etc., are on the ground floor. The wells were constructed in sandy ground, with the foundation about 10 feet below the level of ground water. The concrete floors and buildings are supported by I beams.

The city owns a gasoline engine and air compressor mounted on a single base (taken for taxes) which can be moved to the stations in case the motors or compressors should be damaged.

The Public Service Electric Company charges 10 cents per kilowatt hour for the consumption in each month up to and including an amount equal to 20 kilowatt hours per horsepower of maximum demand. (The maximum demand is taken as 80 per cent of full capacity of motors between 5 and 19 h.p.). Then 6 cents per kilowatt hour for the next 50, 4 cents for the next 500 kilowatt hours and 2 cents for the remainder.

A monthly bill at the Monroe Avenue Station (5 h.p.), is as follows:

80 kilowatt hours at 10 cts.....	\$8.00
50 kilowatt hours at 6 cts.....	3.00
120 kilowatt hours at 4 cts.....	4.80
250	\$15.80

There are 70 house connections tributary to this station.

There are 257 houses and a large hospital draining to

the Randolph Road Station ( $7\frac{1}{2}$  h.p.), and a monthly bill is as follows:

120 kilowatt hours at 10 cts.....	\$12.00
50 kilowatt hours at 6 cts.....	3.00
500 kilowatt hours at 4 cts.....	20.00
690 kilowatt hours at 2 cts.....	13.80

1,360 \$48.80

Some changes in the Randolph Road plant are proposed for the purpose of securing greater efficiency and capacity.

For the above information and the illustrations we are indebted to Andrew J. Gavett, city surveyor and street commissioner of Plainfield.

#### LAYING VITRIFIED BLOCK SEWER.

The city of New Rochelle, N. Y., is now laying under two contracts about 3,000 feet of storm sewer, varying in size from 60 inches to 36 inches in diameter, all of which is being constructed of vitrified sewer blocks. The first construction of this kind which was done in that city was completed about September 1 and consisted of approximately 2,000 feet of 54 and 48-inch storm sewer. All of this work is being done under the supervision of John A. Hadert, Commissioner of Public Works of New Rochelle.

When bids were received last spring for 2,000 feet of storm sewer, proposals for concrete sewer (which had been the construction used in New Rochelle for large sewers up to that time) were found to exceed by a quite appreciable amount a bid for a similar size of vitrified block sewer, and Mr. Hadert concluded to try that material on this section; and on the completion of this work he let contracts, as stated, for two more sections of the same material.

The use of these segment blocks is comparatively new, and some of the details of the methods employed in laying them in New Rochelle are believed to be original with the inspector under whom the first contract was done, Oscar F. M. Kisting. The method now employed is as follows: A block is set in exactly the correct position as to line and grade for the invert of the sewer, and held firmly in this position by stakes, cement, or other method. A line is then drawn, as is the practice in laying brick sewers, from one edge of



DETAILS OF 48-INCH SEGMENT BLOCK SEWER  
SHOWING FORM OF BLOCK.

the last invert block of the completed sewer to the corresponding edge of the block which has been set 15 to 20 feet ahead of the sewer, and the invert blocks are laid ahead from the completed sewer to this guide block. An invert templet is then set in position on the guide block, nails being driven around its edge for fastening the cord at the proper intervals for aligning the edges of the rest of the blocks, and these blocks are laid in succession just as in laying a brick sewer, selected earth or other material being tamped in behind the blocks as they are laid, to hold them firmly in position. The centre for the arch is then drawn forward and set in position, and the arch blocks are put in place.

The blocks used are in reality voussoirs of vitrified clay with four longitudinal openings through each block in order to make them lighter (the openings in the invert blocks also serving to drain the trench), with the inner and outer surfaces curved to the proper radius, with a dovetail joint along each edge, male on one edge and female on the other, and a ship-lap joint on each end. The dovetail joint is about an inch deep, while the ship-lap is about  $1\frac{1}{2}$  inches. The general construction is shown by the accompanying illustration. The strength of these blocks may be indicated by the fact that in one order of eighteen cars sent to New Rochelle from Ohio only five broken pieces were found, and no others were broken in the handling between the cars and the trench. These blocks are made 2 feet long, and the total thickness from inner to outer surface varies from  $4\frac{3}{4}$  inches for 30-inch sewer to  $10\frac{1}{2}$  inches for 108-inch sewer. The width of the block on the inner arc varies from  $9\frac{1}{4}$  to  $11\frac{1}{8}$  inches, and the number of blocks in a circumference from 10 to 30. The number of blocks and width must, of course, be regulated to fit the circumference of the sewer. The weight of these blocks varies from 46 pounds for a 30-inch to 92 pounds for a 78-inch, and up to 124 pounds for a 108-inch. It is seen, therefore, that, for any except possibly the largest sewers, a block can be handled easily without the use of a derrick or any other contrivance. As a matter of fact, in the New Rochelle work the blocks are carried by laborers, one at a time, who walk down the face of the backfill with them and hand them to the block setters. The blocks seem to fit together quite accurately, and the joints and dovetails are so true that, although the centering, which is 8 feet long, is drawn as soon as four rings are completed, laborers walk upon the top of the sewer,



LAYING INVERT OF SEGMENT BLOCK SEWER.

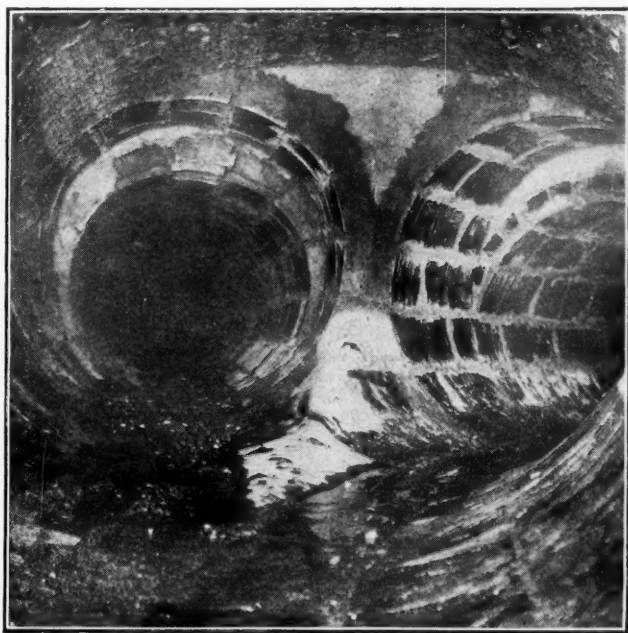


and the backfill is placed immediately without any perceptible distortion of the sewer.

In laying the sewer, cement mortar is placed along the upper edges of the blocks already laid and the succeeding course is shoved home, as in laying brick, mortar also being placed on the top of the ship-lap before the block is shoved in place. No difficulty is found in inserting the final or key block of a ring, as the two next blocks may be pried apart somewhat if necessary to admit it. As soon as a section is laid, and while the centre is being drawn, one man plasters the top surfaces of all of the joints, working the mortar into them with his trowel. The backfilling not only may be placed immediately, but it is considered desirable to do so in order that the blocks may be pressed firmly together at the joints while the cement is still soft. After a section of sewer is completed, the inside joints are carefully pointed in order to give a smooth surface and prevent leakage. In the work done in New Rochelle, as all of these were storm sewers, a small amount of infiltration of ground water was not objectionable, and, consequently, no unusual precautions were taken to secure tight work; but little, if any, ground water was found entering the sewer.

On stopping work for the night, or at any time sufficiently long to permit the cement to set, the centering is blocked up sufficiently to prevent the last ring of blocks from settling, since, should they do so, it would be difficult to connect on with the new work in the morning. This may cause the crown of the sewer here to be possibly a half inch higher than in the rest of the sewer, but there does not seem to be any objection to this.

In laying the sewer, when the trench is kept well ahead of the construction work, 11 men are employed—2 laying the blocks and 9 helpers carrying the blocks, mixing mortar and backfilling. This gang will average approximately 90 feet a day for a 48-inch sewer, and one day last summer such a gang laid 135 feet of this size of sewer in eight hours. The gang which is laying 42-inch sewer at the present time is using an average of about 4 barrels of cement to each hundred feet of sewer. The other contract comprises 60-inch, 54-inch, 48-inch and 36-inch sewer. The amount of cement used on these other sizes was not ascertained.



JUNCTION OF SEGMENT BLOCK SEWERS IN NEW ROCHELLE.

As a curve in the sewer at a junction was necessary at one point, the city experimented to see whether it was possible to use the ordinary blocks in this way, and they found that there was little difficulty in laying a curve of 30-foot radius, as shown by the accompanying photograph.

For providing inlets of small sizes, the manufacturers, the American Sewer Pipe Company, furnish blocks in which have been inserted T or Y spurs, similar to specials for ordinary vitrified pipe. For large inlets for catchbasins or branch sewers, blocks are provided with one corner or end of each so cut that a group of them will leave a circular opening of the desired size. The contractor has found, however, that the blocks can be cut as desired just as can vitrified sewer pipe. In constructing manholes, New Rochelle places concrete under the haunches of the invert at the point where the manhole is to be built; the side walls rest upon the blocks at the springing line of the sewer and upon the tops of the arch blocks, the latter blocks being allowed to protrude slightly into the manhole and being trimmed off after the manhole has been constructed.

#### SCHENECTADY'S INTERCEPTING SEWER.

The city of Schenectady, N. Y., is engaged in a general plan of sewerage improvement, the purpose of which is to cease polluting the Mohawk river and prevent the present nuisance. The river is not used below for drinking purposes, but the nuisance was considered by the State Board of Health to be sufficiently great to make a purification plant desirable. When this work has been completed, the river front will be improved with parking, and it is expected that it will be a pleasure resort for the people.

The sewerage improvements consist of intercepting sewers leading to a disposal works about two miles below the centre of the city. An electrically operated pumping station will receive the sewage collected by two trunk sewers and lift it through a force main to a main intercepting sewer which leads to the disposal plant. One of the sewers leading into the pumping plant is a 42-inch circular sewer, made of reinforced concrete pipe; the other one is a smaller sewer.

From the end of the force main for 2,800 feet a 36-inch circular sewer carries the sewage to a point on the toepath of the old Erie canal. Here the sewer becomes generally rectangular in shape, one object of this shape being to meet the condition of a very little head room. The grade is 0.2 foot in 1,000 feet. The section is 6 feet wide and the side walls 3 feet high, with the invert curved so that its bottom is 7 inches lower. The walls are 8 inches thick, reinforced with rectangular "Cor-bar" rods. The roof of the sewer has five  $\frac{3}{8}$ -inch rods running longitudinally, and  $\frac{1}{2}$ -inch transverse rods, spaced 6 inches between centres. The side walls have two longitudinal reinforcing rods and the bottom two, both  $\frac{1}{2}$ -



DIGGING SEWER TRENCH WITH TRAVELING EXCAVATOR.

inch, with  $\frac{3}{8}$ -inch transverse rods placed at 24-inch centres.

About half of the sewer was built in the summer, and it is the intention to continue the construction during the winter. In a way, winter construction is facilitated by the materials that are available and the methods of construction. There is a crusher in the vicinity, so that stone is delivered on the work immediately after being crushed, by which means all danger of having stone wet and frozen is avoided. Sand, too, comes from a large bank which is not apt to freeze up, and is also delivered fresh on the work. There is no necessity of carrying a large supply of materials on hand at any time, which really is the cause of the greatest trouble in winter work, because when snow or rain comes on the material and freezes it is a very difficult and expensive matter to get it in shape for work again. Moreover, the concrete mixer used is well adapted to the conditions. It is a Koehring half-yard street paving mixer; that is, the concrete is discharged from the end of the mixer and the machine propels itself by its own power, so that the mixer can easily be kept at a position where the concrete is put directly into the forms through chutes. Water is obtained from the neighboring canal. This is heated by turning the exhaust from the engine into a barrel. Sand is heated over curved boiler plates. Cement is brought to the work in teams in such quantities as are needed, no great supply being carried on hand. The amount of concrete mixed in a day is about 60 cubic yards, the speed not being limited by the mixer but by the handling of the forms and the reinforcements and other details of the work.

The invert, of course, is laid first and is carried well ahead. One little peculiarity in this construction is the use of an angle iron every 10 feet as a guide in shaping the invert. The wooden templet is used only at the end of each day's work. Wooden forms are used for the sides of the invert. The forms are built in sections of 16 feet, one section for each side and two sections for the roof, which are held up by timber.

The top of the sewer is close to the surface of the ground throughout, hence the excavation is an easy proposition. Dirt is shovelled into buckets which are lifted up by a traveling crane and thrown to one side or put into bottom-dumping wagons.

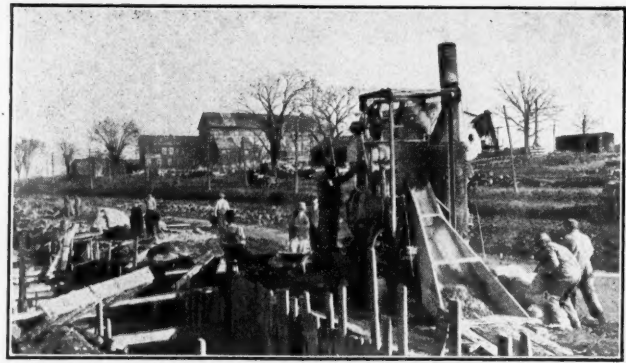
The whole sewerage improvement is being planned and constructed under the supervision of James C. Harding, consulting engineer, New York, and a resident engineer, N. H. Sayford, and two assistant engineers under the general supervision of City Engineer Wm. B. Landreth. The contractor for the work is Charles Ippoliti, of East Orange, N. J.

The cost of the intercepting sewer is about \$80,000; that of the pumping station, \$35,000, and of the disposal works, \$235,000. Descriptions of the pumping station and disposal works will be given later.

#### COURSES IN SANITARY ENGINEERING.

Harvard University is to offer four new courses through its Department of Sanitary Engineering. One is a course in elementary bacteriology for students who have never studied bacteriology but wish to gain a general understanding of the relation of bacteria to the processes of nature, chemistry, sanitary science and health.

The second course is one in municipal sanitary engineering, and is open to graduates and undergraduates specializing in government and business administration. This course deals with the principles of municipal sanitation and sanitary engineering, with special reference to their administration in cities. This will be devoted



SELF-PROPELLING CONCRETE MIXER ON SCHENECTADY SEWER WORK.

to the cost and operation of works rather than to their construction.

The third course is one in demography, for students in the school of health officers and graduate students of the school of business administration and the engineering school, and deals with the study, preparation and interpretation of vital, social and sanitary statistics, with special emphasis laid on their application to public health.

The fourth course is one on rural sanitation, and deals with the principles and practice of sanitation and hygiene as applied to the farm, the summer resort, in camp, etc.

The first and fourth courses will be given by Dr. W. M. Bunker; the second by Professor George C. Whipple, and the third by Professor Whipple and assistants.

#### PAVING WORK AT ARCOLA.

##### For the Information of Paving Contractors.

The city of Arcola, Ill., is to construct by contract 28,114 square yards of vitrified brick paving, and in connection with this 27,342 lineal feet of combination concrete curb and gutter, 1,110 lineal feet of concrete marginal curb, 13,185 cubic yards of excavation, 40 cast-iron storm water inlets, 1,000 feet of 8-inch sewer pipe, 3,600 feet of 10-inch and 1,600 feet of 12-inch. This work is divided into eight sections and two contracts.

The brick paving is to be laid on a 5-inch base of concrete of Portland cement and gravel, with a  $1\frac{1}{2}$ -inch sand cushion, cement grout filler and one longitudinal 1-inch expansion joint. In each case the pavement is 24 feet wide. The combination concrete curb and gutter will be placed on a bed of gravel 4 inches deep and 30 inches wide, the gutter to be 36 inches wide and 6 inches thick and the curb 5 inches wide and 6 inches in height. The concrete marginal curb will be 6 inches wide and 18 inches deep, with no sub-base. The excavating includes grading and preparing the sub-grade. The sewer is of 8-inch, 10-inch or 12-inch vitrified clay sewer pipe, as the case may be, and the bid is to include trenching, laying and backfilling.

The units for bidding will be square yard for paving, lineal foot for concrete curb and gutter and also for marginal curb, cubic yard for excavation and per lineal foot laid complete for sewer pipe.

The contractors will be paid in improvement bonds to be issued by the city against the assessments made for the improvement, the rate of interest being 5 per cent. Under the statute, after the board has accepted a bid, the owners of a majority of the frontage have a right to offer to do the work for 10 per cent less than the accepted bid. Plans, specifications, etc., of this work can be found in the office of the city clerk of Arcola, and also in the office of Claude L. James (the engineer of the Board of Local Improvements), Mattoon, Ill.



# Municipal Journal

Published Weekly at  
50 Union Square (Fourth Ave. and 17th St.), New York  
By Municipal Journal and Engineer, Inc.  
Telephone, 2805 Stuyvesant, New York  
Western Office 608 S. Dearborn Street, Chicago

S. W. HUME, President  
J. T. MORRIS, Treas. and Mgr. A. PRESCOTT FOLWELL, Secretary  
C. A. DICKENS, Western Manager  
A. PRESCOTT FOLWELL, Editor  
F. E. PUFFER, Assistant Editor

Subscription Rates  
United States and possessions, Mexico, Cuba.....\$3.00 per year  
All other countries..... 4.00 per year  
Entered as second-class matter, January 3, 1906, at the Post Office at New York, N. Y., under the Act of Congress of March 3, 1879.

## CHANGE OF ADDRESS

Subscribers are requested to notify us of changes of address, giving both old and new addresses.

Contributions suitable for this paper either in the form of special articles or of letters discussing municipal matters, are invited and paid for.

Subscribers desiring information concerning municipal matters are requested to call upon MUNICIPAL JOURNAL, which has unusual facilities for furnishing the same, and will do so gladly and without cost.

JANUARY 15, 1914.

## CONTENTS

The Operation of Sewage Disposal Plants. (Illustrated.)	
By Francis E. Daniels, A. M.....	67
Sewer Maintenance in Worcester.....	71
Utilization of Sewage Sludge.....	71
Sewage Pumping at Plainfield. (Illustrated.).....	72
Laying Vitrified Block Sewer. (Illustrated.).....	74
Schenectady's Intercepting Sewer. (Illustrated.).....	75
Courses in Sanitary Engineering.....	76
Paving Work at Arcola.....	76
Maintaining Sewage Disposal Plants.....	77
Equipment and Supplies for 1914 Work.....	77
Municipal News. (Illustrated.).....	78
Legal News—Notes of Recent Decisions.....	84
News of the Societies.....	85
Personals.....	86
New Appliances. (Illustrated.).....	87
Industrial News.....	89
Contract News.....	90

## Maintaining Sewage Disposal Plants.

In our issue of October 16 we published a list of 144 sewage disposal plants in the state of New Jersey, these including almost all the methods of treating sewage in common practice in this country. These are all under the supervision and more or less effective control of the State Board of Health. A representative of this board spends his entire time visiting these plants, the primary purpose of this being to see that they are being operated so as to secure the result for which they were built—the preventing of nuisance or pollution of a stream; but, incidentally, this representative makes suggestions and otherwise gives assistance to those in charge of the plants where it seems possible to improve their operation.

It is evident that the frequent inspection of such a large number of plants of such different kinds gives an excellent opportunity to learn the best methods of operating them, and also the relative advantages and disadvantages of different general plans and special details of design under various conditions. In other words, the information obtained should be of value not only to the superintendents of existing plants, but also to those engaged in designing sewage disposal plants.

We are beginning this week the publication of a series of articles by the representative of the New Jersey State

Board of Health who has become familiar with the sewage disposal plants of the state through five years of systematic inspection of them. In these articles he will endeavor to give for the benefit of superintendents and engineers a series of suggestions for the more effective operation of such plants and, incidentally, hints which should be of value in designing plants of this kind.

We have several times called attention to the too little importance placed upon the operation of sewage disposal plants. It is too often assumed that the commonest of unintelligent labor is good enough for this position (one insane asylum in New Jersey has left the care of its plant in the charge of one of its patients, and the resulting condition of the plant is what might have been expected from this). The plants in New Jersey have been designed by engineers varying in capacity from the leaders of their profession in the country down probably to the superintendent who has built a septic tank after a description seen in a farming journal. Undoubtedly, the plants designed by the former will, if properly operated, give better results than are likely to be obtained from those designed by non-experts; but the latter operated by an expert might conceivably give better results than would be obtained from the former if placed in incompetent hands.

Mr. Daniels has suggested a plan of cooperation by which cities or institutions operating small plants might obtain the advice and supervision of experts at small charge, and we recommend this plan for careful consideration. It should be remembered that a sewage disposal plant ordinarily involves the principles of chemistry, bacteriology and engineering, and that neither the average town engineer nor general physician is qualified to pose as an expert in such matters. As a matter of fact, many engineers who have designed plants of this kind are not sufficiently familiar with the details of operation. There are, however, a number of engineers scattered throughout the country who have had considerable experience in the operation of two or three, at least, of the more common types of disposal plants, and who would be competent to serve in the capacity suggested.

## Equipment and Supplies for 1914 Work.

We have several times referred to the advantage of having councils decide early in the year what work is to be done during the coming season, and are glad to see that several cities are already advertising next season's work. But there is still another line of action, made possible by this, which should be considered early by those cities which do their own public work by direct employment of labor, and also by contractors who are so fortunate as to obtain contracts at this time, namely, the ordering of equipment and supplies for the work. In the spring, dealers and manufacturers are generally overwhelmed with orders and find it impossible to deliver goods as fast as they are called for, which results in delays of the city work and consequent losses, possibly in having to do without economy-securing appliances.

This is more true of equipment than ever before, because labor troubles and inventions have combined to bring about an increasing substitution of machinery for hand labor in all branches of work. The sewer superintendent or contractor can no longer expect to work economically or compete with others with no equipment but a few picks, shovels and wheelbarrows. He must have labor-saving mechanical devices; and the variety of these is becoming so great that he should take time to investigate and select those most suited to his needs. And he should do this now, and not wait until the work begins, when his hasty decision may be an unwise one and immediate delivery be impossible.

# The WEEK'S NEWS

Illinois' Highway Prospects—Street Improvements in Syracuse, N. Y.—Efficiency of Sewer Excavator—Typhoid Prevention Here and Abroad—Mitchel Fires Last Blast in Aqueduct Tunnel—City Planning Committee for New York—Liability Insurance for City Employees—Cleveland (O.) Plans Model Suburbs.

## ROADS AND PAVEMENTS

### Experimental Highway to Be Constructed.

Oakland, Cal.—The State Highway Commission yielded to the importunities of good roads enthusiasts at a meeting in San Francisco when it agreed to construct a three-mile strip of experimental road in Alameda county at points to be determined by the Alameda county supervisors. The state officials, however, insisted that they would allow only the customary pro rata of \$8,000 to \$10,000 a mile for this strip, the extra cost of superior construction being borne by interested parties who desired to see an experiment road in construction undertaken. In the proposed strip there will be at least a dozen different specimens of road designed by road builders. Each of these specimens will be open to the test of ease, attractiveness, durability and economy. After an indefinite time for the testing of the roadway, the California highway commission will determine what should be the specifications which should enter into the construction of roads in certain localities of the state, taking into consideration climate, class of travel and kind of service expected from the thoroughfares. Alameda county was selected for experimental purposes because of its general climate, which is typical of California.

### Michigan's Progress in Road Construction.

Lansing, Mich.—State Highway Commissioner Rogers reports that there is a total of 2,244 miles of state reward roads in Michigan. The state official in discussing the new highway laws enacted by the last Legislature says that the progressive changes have added greatly to the work of the state highway department. In his report the Commissioner said: "At the close of the fiscal year, June 30, 1913, 1,754 miles of roads had been built on which \$1,164,572 of state reward money had been paid. This was an average reward of \$664 a mile. Between July 1, 1913 and Dec. 1, 1913, the last date on which our books were balanced, there had been built 383 miles of ordinary reward roads and 22 miles of trunk line roads. Since December 1, 79 miles of ordinary roads have been accepted and six miles of trunk line roads, making a grand total of 2,244 miles of state reward roads in Michigan on January 1, 1914."

### New Equipment Helpful in Road Work.

Lexington, S. C.—The Lexington County chain gang is now at work on the Orangeburg road leading from Lexington Court House to the town of Swansea. This is one of the most important roads in the county, and when completed it will be of more service, perhaps, than any road in the sand hill section. The county now has one of the best outfits for building roads of any county in the State. A large road machine, propelled by gasoline, is used for many purposes. The county has recently purchased five car boxes for the purpose of hauling clay on the roads in the sand hills, and when the entire outfit is put into play it makes almost a complete string of cars. With the new equipment the county can build roads rapidly.

### Illinois Has \$2,200,000 Available for Roads.

Chicago, Ill.—Illinois has a fair prospect of becoming one of the leading States of the nation in the matter of good roadways. Although there has been, on the average, about \$7,000,000 spent annually upon the roads of the State during recent years by counties and other agencies, the fact remains that of the forty-eight States of the Union, Illinois, third in population, has ranked only twenty-fourth in improved road mileage. This has been due to lack of co-ordination and co-operation among the counties in road building, with the result that almost half

—or, to be exact, 37½ per cent.—of the amount expended for roadways in the State in the past has been wasted. The last Legislature, in response to a general demand for a better system of highways and a more systematic expenditure for roads, voted a State aid act, by means of which the great sum of \$2,200,000 was made available during the biennial period of 1913-14, by far the greater portion of which will be spent in 1914. Of this sum, the State will contribute \$1,100,000 and the counties the same amount. This money will be distributed among the various counties, under certain well-defined conditions, the State giving aid to the counties in proportion as the latter appropriate funds for roadway improvement.

### No Limitation on Asphalt.

Albany, N. Y.—Hereafter there will be no limitation placed by the State Highway Commission on the kind of asphalt that may be used in construction of State highways in which it is necessary to use asphalt. This determination has been reached by Commissioner Carlisle of the State Highway Department and at the present time a new set of specifications is being prepared so that the asphalt used in connection with the State roads in New York will be open to the entire world. This will not, it is explained, as may at first appear, suffer the State to be defrauded or beaten by the use of inferior grades of asphalt, for the new specifications will also have a provision that the asphalt must be sold and used under a guarantee for three years. In reaching this conclusion to throw the asphalt open to the markets of the world, Commissioner Carlisle has finally determined to pursue the course that was suggested by Governor Glynn at a recent conference he held with Commissioner Carlisle and Commissioner Delaney of the Department of Efficiency and Economy.

### Street Improvements in Milwaukee.

Milwaukee, Wis.—This city in the work of street construction and repair for the season of 1913 has broken all records of previous years. The repair work particularly is worthy of comment in that practically all previous records for the amount of work done, the economical prices at which it has been possible to do the work, and the general thoroughness thereof, have been exceeded. Following is a detailed statement of the amount of work, in square yards, which has been done under the direction of this department during 1913:

	PERMANENT.	
	City.	Private Contract.
Asphalt .....	158,514.55	114,740
Brick .....	71,711.67	3,140
Granite .....	8,776.34	.....
Sandstone .....	47,277.55	2,365
Limestone .....	19,202.58	.....
Water bound macadam .....	.....	27,305
Bituminous macadam .....	32,148.28	.....
Cresosoted block .....	31,043.69	19,290
Totals .....	368,674.66	166,840
REPAIR WORK.		
Asphalt, square yards .....	.....	29,775.00
Block paving, square yards .....	.....	25,870.00
Macadam, square yards .....	.....	685,353.00
Cement walks, square feet .....	.....	123,905.01
COST PER YARD, IN CENTS.		
	1913.	1912.
Asphalt .....	51	84
Macadam .....	10	30
	1911.	
Asphalt .....	99	
Macadam .....	77	

### Notable Year for Street Improvements in Syracuse, N. Y.

Syracuse, N. Y.—Some striking facts are given in the annual statistical report of the Bureau of Engineering made by Henry C. Allen, the retiring city engineer, showing the extent of local improvements undertaken and completed in 1913 and also comparing them with previous years. More miles of pavement were laid than in any other year of the



city's history. The value of contracts completed was \$742,215.42, the highest mark ever reached, and more than twice the value of those of 1912. For the year the contracts awarded, completed and in various stages of completion amounted to the total of \$1,155,304.42. During the year 7.97 miles of new pavements were laid at a cost of \$401,781.09. This does not include several pavements which were resurfaced, the longest being more than a mile. The highest previous record was in 1899, when 6.93 miles were laid. There are 263 miles of streets in the city, and, with the work done last year, 87.13 miles, or nearly 33½ per cent., are paved. Contracts have been awarded for nearly four miles of new pavements to be laid in the spring. Eight and four-tenths miles of sewers were built during the year at a cost of \$91,745.83. This makes 182.80 miles of sewers in the city, covering practically 70 per cent. of the street mileage and including nearly all the built-up localities. During the year 8.63 miles of cement sidewalks were laid at a cost of \$28,477.98. This is about the yearly average for the past seven years, during which 73.6 miles were put down. No new wooden walks have been permitted during the last twelve years. The amount of streets graded in 1913 was 2.85 miles, and the work cost \$26,357.70. The miscellaneous contracts, including resurfacing of pavements, street sprinkling, collection of ashes and the like, amounted to \$193,852.82.

#### Issues Attractive Report.

Richmond, Ind.—City Engineer Fred. R. Charles, of this city, has issued an attractive annual report consisting of a blue print booklet in which there is neatly set forth the splendid progress made by Richmond in its street and sewer work and in the construction of the municipal electric light plant addition, costing \$28,245.42. The details of that report have already been published in the January 1st issue, but credit was unintentionally given to Richmond, Va. City Engineer Charles recommends in his report the increase of permanent pavements, greater attention to bridge maintenance and the reconstruction of sewers that have become inadequate through long use.

#### Paving Progress in Springfield, Ill.

Springfield, Ill.—According to the records of City Engineer Wade D. Seeley, the amount of paving done in Springfield during the last year is 2.14 lineal miles or 38,296 square yards, at a total cost of \$73,679.03. During the year 10,521 lineal feet of sewer has been laid, at a total cost of \$8,727.16.

#### For Permanent Highways.

St. Augustine, Fla.—At a meeting of the Board of County Commissioners a delegation of prominent citizens and large taxpayers appeared before the board and urged that more permanent paving material be used on the main county highways. In the petition submitted they asked that a system of brick or cement block roads should be constructed as means of developing the county and realizing upon its resources. It was stated by the delegation that the sentiment in the county was in favor of bonding for money to give a system of permanent roadways.

## SEWERAGE AND SANITATION

#### Plan Storm Sewer System.

Eugene, Ore.—The entire new sewerage system recently completed has been placed in operation. The trunk and lateral sewers are about 15 miles in length and were constructed at a cost of \$240,000. Great credit is due to the committee that was placed in charge, of which Mr. W. A. Bell was chairman. With the announcement of the completion of the new system, a plan was revealed looking to the construction of a secondary system to carry away drainage water at a cost, for the initial move, of about

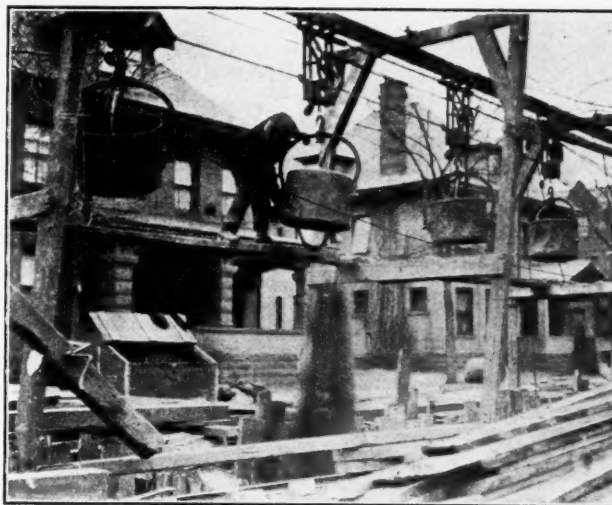
#### Plan 36-Inch Sewer System.

Mason City, Ia.—This city made an unparalleled record last year in the number of feet of sewers constructed. Over forty-two thousand feet have been laid, a little more than eight miles. There have also been a mile and a half of paving laid at a cost of \$39,000. For the present year one large thirty-six inch sewer, seven thousand feet long

is now being planned by the city engineer and within a few weeks this will be let.

#### Carrier System Saves Time and Expense.

St. Paul, Minn.—In the construction of the new sewer on St. Albans street, this city is employing a great labor-saving device in the carrier system. By means of the equipment a trench may be dug to practically any depth required with one handling of the dirt. The carriers are supported by a heavy cable which is suspended on a wooden framework twenty feet high. At one end a 30-horse-



Courtesy St. Paul (Minn.), Pioneer Press.

CARSON-LIDGEWOOD TRENCHING MACHINE.

power engine moves the carriers along rails. In speaking of this system Mr. M. E. Thornton, of the contracting firm, said: "There are many advantages obtained through the use of this new apparatus. The first is to the public. The street where the sewer is being dug never is blocked. There are no mounds of dirt on either side of the trench. The work is done in less than half the time formerly required. The six buckets, which contain 30 cubic feet of dirt, are filled, elevated, carried to the other end, dumped and returned in less than two minutes and thirty seconds."

#### Typhoid Prevention.

New York, N. Y.—The Central Council of Public Health of the City of New York has prepared a report on the typhoid fever epidemic in the Borough of Manhattan last fall. The report, which is an exhaustive one, shows that the recent outbreak of the disease had its origin in contaminated milk. This fact, in the opinion of Dr. Armstrong and E. H. Lewinski-Corwin, Ph. D., who prepared the report, emphasizes the need for efficient pasteurization of all raw and certified milk. In order to impress upon the medical profession the fact that sanitary supervision in this country does not begin to safeguard the public against typhoid to the extent that it does in Europe, the Council has prepared this comparative table of the death rates in 1910:

#### DEATHS FROM TYPHOID FEVER PER 100,000 OF POPULATION.

Hamburg	2.5
Berlin	3.6
London	4.0
Vienna	4.1
Paris	6.7

In contrast, the figures of the five largest American cities for the same year are:

New York	11.6
Boston	11.6
Chicago	13.7
Philadelphia	17.4
Washington, D. C.	23.2

#### Novel Scheme for Enforcing Anti-Spitting Law.

Fort Worth, Tex.—A novel scheme for enforcing the anti-spitting law has been evolved by Dr. A. R. Hays, city physician. At present violators of that law must pay the cost of the trial, \$8.95, and a fine of \$1. The police, it seems, are reluctant to enforce the ordinance, so Dr. Hays suggests that only a fine and strict enforcement of the

ordinance be established. The fine should be \$2.50 or \$1.50, and the officer should be allowed 50 cents for each arrest. The policemen, carrying numbered stub receipt books, might be empowered to issue receipts and collect the fines immediately.

#### War on Typhoid.

Pittsburgh, Pa.—With the announcement that unrelenting warfare has been started against typhoid fever and other water borne diseases in the Pittsburgh Metropolitan District, State Commissioner of Health Dr. S. C. Dixon announced that he will call a meeting of representatives of all cities, boroughs and townships in this district and that an exhaustive investigation of water works, filtration plants and sewers and sewage disposal plants will be made. The meeting will be held in Pittsburgh within a short time. Dr. Dixon claims his department has decreased the prevalence of typhoid fever by 67 per cent since 1905.

### WATER SUPPLY

#### Mayor Mitchel "Holes Out" Aqueduct Tunnel.

New York, N. Y.—On Monday Mayor Mitchel threw an electric switch in the tunnel of the new Catskill Aqueduct and the explosion of a comparatively light charge of dynamite which followed, removed the last barrier in the great tube which now extends uninterrupted from the Ashokan Reservoir to Flatbush. When the tunnel has been lined throughout with concrete and the control apparatus has been installed in the shafts, the aqueduct will be ready for use. This work will require another year for completion. The total cost to date is about \$130,000,000.

#### New Jersey May Purchase Water System.

Paterson, N. J.—It was reported that the expert appraisers of the state water commission have placed the value of the water rights now held by the East Jersey Water Company at \$10,000,000. These experts have been engaged for several years in making a survey and drawing up a detailed report showing all the property, real and personal, now held by the company. The water company has also had its appraisers at work and it is intimated that their valuation will exceed the state's by several hundred thousand dollars. The report of the experts, soon to be submitted, will be a climax to all agitation and legislation on the water plant problem which has been going on for nearly twenty years. It is expected that the ultimate result will be the acquisition by the state of the water supply; the cities will buy the water and distribute it to the consumers. If the company places too high a figure on its property, the state may acquire the same by condemnation proceedings.

#### To Compel Installation of Meters.

Peoria, Ill.—Claiming that the Peoria Water Works Company is charging excessive rates and realizing that demands for lower rates will not be granted, the consumers here have urged the utilities commission to enforce the ordinance requiring the installation of meters upon request. There are 12,000 consumers and some 400 have meters. The mayor and corporation counsel propose to ask the commission to compel the company to give every consumer in the city a meter. The rate ordinance provides that each consumer shall pay 20 cents a thousand gallons up to a consumption of so many gallons, when the rate drops abruptly to 6 cents a thousand gallons.

#### Contract for Reservoir.

Hancock, Md.—Hancock will own the first municipal system of waterworks in this section, the contract for the building of a reservoir and laying about a mile of mains through the town having been awarded by the town council to I. G. Robinson, who has been engaged in building the model state road through that section. The contract price for the improvement is between \$15,000 and \$18,000. The reservoir, which will be located on a hill north of the town, will be 200 feet in diameter, 10 feet deep and have a capacity of half a million gallons of water. The supply of water will be obtained from two artesian wells.

#### New Wells Eliminate Water Famine Danger.

Fremont, Neb.—One of the most important municipal improvements in Fremont for the past year, the addition of twelve new wells that supply very pure water, will insure this town against any danger of water famine. The wells have a diameter of 12 inches and are sunken to a depth of approximately 80 feet. The plant has two pumps, one of which will be replaced by a Corliss pump of the cross compound crank and flywheel type with a capacity of 3,000,000 gallons at a piston speed of 200 feet a minute. The contract has been let and the pump will cost \$9,295.

#### Recommend Meters to Offset Water Waste.

Pittsfield, Mass.—In a report submitted to the city by the Pittsfield Water Committee the question of water waste was thoroughly discussed and the use of meters to counteract that waste was urged. The daily per capita consumption was 129 gallons for the year 1912. Last year, when all the reservoirs were in service, the per capita average increased to between 168 and 183 gallons. Therefore the committee stated in its report that "the use of water in this city is excessive" and recommended that "all public and private service pipes be metered without delay." The general use of meters, it was said, would not necessarily cause a raise in water rates.

#### Well Water for City Mains.

Battle Creek, Mich.—After years of controversy over the question, Battle Creek has started pumping water from five wells at Verona, in the hope that eventually the old source of supply, Lake Goguaac, can be abandoned. After a week's test which is expected to show to what an extent the wells can meet the demand, the Verona station will be locked up until May 1, when it will be put into general use. The first test was unsatisfactory, as it showed mud and sand in the mains.

### STREET LIGHTING AND POWER

#### Changes in Philadelphia's Lighting System.

Philadelphia, Pa.—Preparatory to the installation of the modern tungsten electric lighting as a substitute for gasoline lamps and arc lamps, Director Cooke has made public some of the plans for a change in 4,000 gasoline lamps to electricity and 700 arcs to incandescent globes. The plan involves, as the Director explains, a reduction in the price of light, which is made possible by the substitution for existing lights of the tungsten globes, which are revolutionizing the lighting problem, both as to brilliancy and economy in power. The city also proposes to take over the bulk of remaining gasoline lamps and continue the service. There is also pending a proposition submitted to the United Gas Improvement Company as to the substitution of gas for gasoline in territory that will involve the extension of the company's gas mains. It has already agreed to transfer 700 lamps where its gas mains now exist in close proximity to the gasoline lamps. Director Cooke is proceeding with plans for the city taking over the lighting of some of the gasoline lamps now operated by the Welsbach Street Lighting Company, under a two months' contract.

#### Lighting System in Operation Soon.

Kalamazoo, Mich.—It is believed that the new lighting system for Kalamazoo will be completed before the end of this month. Work on the new plant is nearly at an end, with the exception of the installing of two more car loads of machinery. The two 300-horsepower boilers are being placed at present and within a few days will be ready for official testing. Of the eight arc light circuits throughout the resident districts of the city, five have been re-wired and installed. As soon as the plant is ready for operation, the circuits will be transferred to the new plant as fast as possible. Weather permitting, the ornamental system should be completed and ready for operation within another month. The ornamental posts were made by the George Cutter Company, South Bend.



**Bill to Force Wires Underground.**

New Bedford, Mass.—A bill, to be presented to the legislature soon, has been prepared by the special city council committee in conjunction with the inspector of wires, so that the city may inaugurate a campaign to rid certain streets of unsightly poles and wires. In that bill provisions are made for the construction of at least one mile of underground conduits a year. After passage of the bill no individual or corporation may, except temporarily, use poles or other structures for the support of wires. Should the orders of the city be then evaded, the city will remove poles and charge the expense for such removal to the party involved.

**City Buys Light Plant for \$145,000.**

Manitowoc, Wis.—After much discussion which continued over a year between Mayor Stolze and the opponents of municipal ownership here, Manitowoc has taken over its electric light plant for a consideration of approximately \$145,000. The city now owns the light plant and the waterworks and, according to a statement issued by Stolze, the next move of the city will be made against the gas plants and the local telephone company.

**Center of Paris is Dark.**

Paris, France—The center of Paris was plunged into darkness last week, by the breaking of an electric cable. Restaurants and cafes were crowded, and candles were lighted. There was a bad tangle of vehicles in many of the streets. Owing to the failure of the current, the subway suspended operations for a considerable time.

**Reduce Gas Price.**

Norristown, Pa.—The Counties Gas and Electric Companies have announced that the price of gas to small consumers would be reduced from \$1.25 to \$1.15 a thousand feet, while large consumers who burn over 25,000 feet a month, will pay 90 cents a thousand. There has also been a reduction in electricity. The minimum charge will be \$1.50 per meter per month.

**FIRE AND POLICE****To Induce Appreciation of Modern Fire Equipment.**

Salt Lake City, Utah.—A decided contrast between modern and early fire-fighting apparatus of Salt Lake has been shown in the display prepared by Fire Chief W. H. Bywater at central fire station. It includes four buckets, a hose cart and a chemical brought to Salt Lake before 1860. Chief Bywater said: "Salt Lake has the most up-to-date fire equipment of any city in the United States, and since the citizens do not seem to appreciate that fact I have decided to demonstrate it. The fire station will be open to visitors from 10 a. m. to 10 p. m., and I hope that every man, woman and child of the city will find time to come in and look things over."

**Use Oxygen Helmets in Fighting Fire.**

Johnstown, Pa.—An incipient fire, which threatened for a time to become a conflagration, brought Chief Keller and several companies to the Ellis building. By a thorough and concentrated attack the blaze was soon checked. The efficiency and scientific handling of the fire department under Keller's able supervision, was largely made possible by the oxygen-equipped helmets which the firemen were obliged to don in order to invade the smoke-filled cellars. Those helmets purchased from the Draeger Oxygen Apparatus Co., of Pittsburgh, Pa., were received here several months ago and have been found to be a valuable addition to the fire apparatus of this city.

**Fire Physician Salaried.**

Baltimore, Md.—It has developed that the Fire Department has put into effect a rule abolishing the fee system in connection with the department physician. That official is now placed on an annual salary of \$2,500. The new rule, which went into effect at the beginning of the month, is a great boom to the members of the Fire Department.

Until now they have been required to pay from their own pockets for all medical services rendered by the department physician, Dr. J. J. Valentini, exclusive of the two visits that the physician is required to make upon each member of the department free of charge.

**Cannot Take Fire Bureau Out of Politics.**

Pittsburgh, Pa.—City Councilmen of Pittsburgh are united in claiming that it will be impossible to take the city bureau of fire out of politics. Discussion of the possibility of such action came through the offer of Pittsburgh Board of Fire Underwriters to materially reduce fire insurance rates if the bureau of fire is operated without political influence on the appointments and removals. A plan by which it is claimed this can be accomplished, with the honest cooperation of the civil service commission, has been drawn up by G. W. Booth, chief engineer of the National Board of Fire Underwriters, and submitted to Council.

**MOTOR VEHICLES****Order American La France Engine.**

Quincey, Ill.—The fire engine which is now in the course of construction by the American La France company of New York will probably not be delivered before February 15, according to a report made by Alderman Bickhaus, chairman of the board, following the receipt of a letter from the company a few days ago. The company writes that it does not wish to slight any part of the work and that to do a perfect job the necessary time must be had.

**Purchase White Hose Wagon.**

Olympia, Wash.—This city has placed an order for a 3-4 ton, 40 horsepower White hose truck for its fire department. The city council in choosing this car was guided largely by a demonstration before a meeting of fire chiefs in Los Angeles at which the White hose wagons were subjected to a severe speed test and emerged with a splendid showing.

**Compromise By Purchasing Two Different Machines.**

Red Bank, N. J.—Difference of opinion on the part of the Independent Hose Company and the borough council has been compromised by the purchase of an American-La France triple combination automobile pump and a similar machine from the Robinson company. The Robinson pump will arrive in about 90 days, while the American-LaFrance people say that their machine will be delivered about the same time.

**Test Shows Merits of Waterous Engines.**

Bridgeport, Conn.—An exhaustive test was made by the fire department here, of the new number 3 and 2 Waterous Engines. The new pumps were connected to one of the three-way hydrants and through four lines of hose, 150 feet in length, approximately 1,720 gallons of water per minute were thrown by means of the four-way "gun" or Monarch deck nozzle. Not only was the volume of water large, but the force was sufficient to send the water to a height of 175 feet. The results of the test were highly successful and gratifying to the Board of Fire Commissioners.

**GOVERNMENT AND FINANCE****Will Have Committee on City Planning.**

New York, N. Y.—One of the chief standing committees of the new Board of Estimate, it was learned on the best authority, will be a Committee on City Plan. It will in all likelihood be headed by George McAneny, president of the Board of Aldermen, who has long been an advocate of intelligent and orderly city planning and has given much study to the subject in the past. This action of the Board of Estimate will be a striking illustration of the recognition which is now being generally accorded the principles of orderly city planning, after years of effort in that direction by some of the far-sighted citizens of this city. The need of some committee to which the questions of the big pub-

lic improvements, which are constantly being brought before it, can all be referred, so that they may be worked out harmoniously, has long been felt by the Board of Estimate. Where such matters have been put in the hands of hastily appointed committees there has always been more or less friction and delay. The fact that Mr. McNeny will probably head the committee and that he will have three votes in the new board seems to indicate that the functions of the committee will be regarded as important.

#### Defeat Commission Form Again.

Atchison, Kan.—Commission form of government has again been defeated in a special election by a majority of 813, of 2,865 cast. Not a single ward in the city gave a majority for the new rule. This was the third attempt to change to commission form in Atchison and the most decisive defeat ever administered. The result was probably due to the fact that many regarded the attempt to inaugurate the new rule at this time as a personal attack against Mayor Finney, whose term would have been cut in two by the change.

#### Camden Mayor Favors City Planning Commission.

Camden, N. J.—Mayor Ellis' message, advocating the creation of a City Planning Commission, has caused favorable discussion here, for it is realized that with Camden's steady growth suburban points will soon be incorporated. The Mayor, in his message, said: "I would regard it as one of the best periods of my official life if during the year we could get under way a plan for comprehensive beautifying. By this I mean a system of beautifying the streets and their environs. Such a plan as I have in mind would require several years to follow out. In the prosecution of the work the city could be laid out in sections and they could be taken up one at a time under the direction of the Highway Department and the special committee recently named to look into the feasibility of the South Camden Boulevard plan and other street improvement plans."

#### Third Class Cities Want Commission Government.

Henderson, Ky.—A committee has been named at the Council meeting, composed of Mayor Johnson, City Attorney B. S. Morris and Councilman E. C. Ward to confer with other third-class cities and push the matter of securing an enabling act from the Legislature for a commission form of government.

#### Lebanon (Pa.) Has Improvements in Prospect.

Lebanon, Pa.—The endorsement of the fifth amendment to the constitution by state voters will make possible the city improvements and prospects for a greater Lebanon, which have been agitated for some time. As a result of that amendment the borrowing capacity of this city will be increased to the extent of probably \$300,000. This sum would supply ample funds with which to proceed with any municipal improvement which may be projected.

### STREET CLEANING AND REFUSE DISPOSAL

#### Lauds Use of Flushing Machines.

Atlanta, Ga.—Chief John Jentzen, of the city sanitary department, is in favor of doing away with street sweeping machines and cleaning the streets entirely with street flushing machines. The chief said that street sweepers are out of date, and street flushing machines are the ideal things to clean streets with. They lay the dust, wash everything into the gutters, and cause the waste to flow straight into the sewers. In submitting to the finance committee of general council the annual budget of the needs of his department, Chief Jentzen will strongly urge an appropriation to purchase six additional street-flushing machines. These, together with the six he has now, would enable him to keep nearly all the paved streets washed the year round. The chief also will ask for two additional auto trucks for hauling refuse and garbage.

#### Prominent Men Clean Streets.

Leeds, England.—Sixty prominent professional and business men, comprising doctors, lawyers, clergymen and

merchants, acted as street sweepers here, giving a practical demonstration of the determination of the citizens of Leeds not to yield to the employes of the municipal service, who are on strike because the city would not grant what it considers the men's inordinate demands. The streets had not been swept nor garbage cans emptied for nearly a fortnight, so a citizens' league was formed of volunteers willing to keep the public works in operation. Many of the volunteers drove to the place of assembly in their automobiles at midnight. They were soon equipped with brooms and shovels, supplied with garbage trucks and they worked steadily for six hours cleaning the streets under a police guard.

#### Has 24 Wagons Hauling Garbage.

Schenectady, N. Y.—The department of waste disposal is making every effort to dispose of the garbage which has accumulated as a result of the delay in the work caused by the recent snowfall and zero weather. Commissioner of Public Works Joseph H. Clements has put out six additional wagons for the collection of garbage. These bring the number of wagons employed in this work up to 24, of which 20 are owned by the city. Seventy-five men are employed and an average of 160 loads of garbage are removed daily at an approximate cost of \$1.25 a load. A majority of the wagons used are especially constructed for this work and are said to be so far superior to any other kind that an appropriation for the purpose of equipping the entire department with this type of wagons will be asked for. These wagons, made by the Watson Wagon Company, of Canastota, New York, have a capacity of 65 cubic feet, as compared with the 41 cubic feet of the ordinary Watson type dump wagon, and in addition require only one horse to draw them.

### MISCELLANEOUS

#### Plans Model Suburb.

Cleveland, Ohio.—This city plans to develop a model suburb of 500 houses, on a municipal allotment of ninety-three acres, a project which is said to be new in the history of American cities. The model suburb is to be more than the orthodox suburb of model dwellers as developed by real estate speculators. Cleveland's model suburb is to institute a modified communism upon basic ideas, which will effect a municipal experiment in "deliberate, conscious and orderly city growth." It is to provide enough land to allow full play to every legitimate impulse of its tenant families; a fixed percentage of the land is to be devoted to front-yard and back-yard gardens, and another percentage to playgrounds, including small children's grounds, tennis courts, croquet grounds, baseball diamonds, etc. The experiment provides for grouping dwellings into units, and by the arrangement of these dwelling units it is to seek a complete and harmonious expression of organized community life. A positive community control is to be established over every square foot of its land. The model suburb is to fix a new size and shape of lot, to adapt street widths to building heights, to seek a maximum of narrow streets and to hold improvement costs as low as is consistent with durability.

#### Provide for Municipal Storekeeper.

Baltimore, Md.—Although there is no doubt in the minds of city officials of the city's right to create the office of Municipal Storekeeper, the city will be protected in this case by a bill to be sent to the next Legislature, authorizing the establishment of the new position. Charles Wilson has already been named for this new position at an annual salary of \$1,300, and has been at work for more than two months ascertaining the needs of the different departments preparatory to ordering the supplies. It is expected that this new city department will result in a large annual saving, for through it all of the other municipal departments will be supplied with every requisite from a pencil to a shovel.

#### To Have 1,500 Acres Playground and Park.

Omaha, Neb.—The establishment, near Omaha, of a park and playground of not less than 1,500 acres, with a museum,



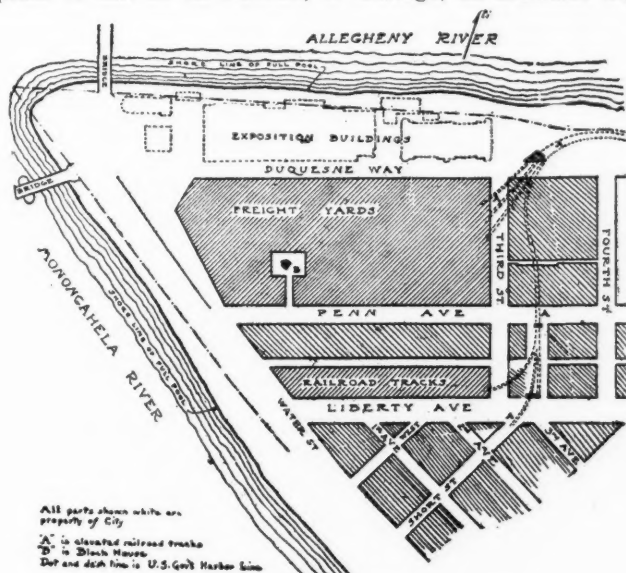
Zoological gardens and aviary, is the program of the Fontenelle Forest Association, which has just filed with the secretary of state articles of incorporation under a special enactment of the last state legislature. The association will depend entirely upon public contributions, either in the form of money or land, and then when the desired tract has been acquired the park will be turned over to the state, to be used forever as a public pleasure ground. One of the features of Fontenelle Forest reserve will be the erection of a state museum for the housing of archaeological specimens, Indian relics and records of historical value. It is believed that the Nebraska Historical Society and the Nebraska Pioneers' Association will take an active interest in the proposed museum. It is estimated that not less than \$500,000 would be needed at the outset from the state to start the museum and a few other features.

#### Provide for Municipal Ownership.

Kalamazoo, Mich.—City Attorney Schaberg has completed the charter amendment providing for the ownership and operation of public utilities by the city. The amendment will be submitted to the voters at the spring election. The provision makes it possible for the city to acquire and operate public utilities for the supplying of heat, light, power or transportation to city, for its citizens either for commercial or municipal purposes. The service can be rendered by the utilities outside the city, not to exceed 25 per cent. on the amount furnished within the city. Transportation lines can operate for a distance of ten miles outside the city limits. None of the utilities can be acquired without a two-third vote of the people at the regular or special election, provided the council has approved them. The council may borrow money for acquiring the utilities, not to exceed 2 per cent of the assessed valuation of all personal and real estate of the city.

#### Commission Asks for Recreation Improvement.

Pittsburgh, Pa.—With the idea of improving what is known as the Point District, a section of land easily accessible for recreation to the downtown residents of Pittsburgh, the Art Commission has delegated the task of devising plans to Mr. E. H. Bennett, of Chicago, an architect well



THE POINT DISTRICT.

versed in city planning. The accompanying design, according to reports, may be accepted as an advance idea of how the "Point" will be beautified in the future. According to J. W. Beatty, president of the commission, Mr. Bennett's work will be along artistic and comprehensive lines. The architect suggests the utilization of adjoining strips of land as parts of the general improvement, which would surround a pool that might be used for boating and other outdoor sports.

#### Denver Plans Nation-Wide Advertising.

Denver, Colo.—Nation-wide advertisement of Denver as an attractive and profitable place in which to live is being

planned by the Clearing Association and will be sent out within the next few days. This campaign, conducted through magazines and weekly newspapers, will cost \$100,000 for the year and will reach, it is estimated, 75,000,000 persons in the United States and Canada.

#### Municipal Building Opened.

Portland, Ore.—The new municipal building has been opened to the public. It will be used to house not only administrative departments but also the police headquarters and court. A rather unfortunate feature of the court room is



Courtesy Evening Telegram.

NEW MUNICIPAL BUILDING.

its poor acoustic properties: the tiled floors and the wall construction have caused a blurring of sounds and annoying echoes.

#### City to Carry Own Compensation Insurance.

Bridgeport, Conn.—Mayor Wilson in a special message to the Board of Aldermen discussed the city's liability under the Workmen's Compensation Law, stating that in his judgment it would ill become this city as a governmental agency to put itself out of line with this industrial reform. The mayor stated that he and the city attorney had gone over the matter thoroughly and had decided that to carry compensation insurance on its employees through insurance companies would cost the city more in annual premiums than the amount of the compensation to be collected by injured workmen. The message of the mayor therefore recommended to the council that the city carry its own compensation insurance, meeting the payments to any possible injured employees from its general funds, as the occasions may arise.

#### Compensation Insurance for City Employees.

Berkeley, Cal.—According with the spirit underlying the new State workmen's compensation law, which has just gone into effect, the city of Berkeley has created a compensating insurance fund for the city employees who sustain liabilities in the performance of their duties. This fund, created by ordinance, will receive a tax one-half cent on each \$100 of assessed valuation until it amounts to \$10,000.

#### City to Haul Coal for Poor.

Denver, Colo.—Wherever cases of suffering are found because of lack of coal the city will send its teams to coal yards, take the amount of coal needed to relieve the suffering and deliver it without regard to the coal companies. The commissioners blame the coal companies for the existing conditions of privation: a strike, they say, was incited for the purpose of artificially raising prices. Commissioner Hunter, in speaking of the situation, stated that, whether consumers had orders with the companies or not, he would have coal delivered by the city in spite of possible objection from the companies and pay for it later.

## LEGAL NEWS

### A Summary and Notes of Recent Decisions— Rulings of Interest to Municipalities

#### Adverse Possession—Evidence—Payment of Taxes.

*Curtiss & Yale Co. v. City of Minneapolis.*—The rule that the payment of taxes by the person claiming title to land by adverse possession is strong evidence in support of his claim of adverse occupancy applies with less force when the land is assessed under a description which includes land with reference to which such person is under legal duty to pay the taxes as actual owner.—Supreme Court of Minnesota, 144 N. W. R., 150.

#### Water Company—Taxation—Exemption.

*Phillips et al v. City of Portsmouth.*—A provision of a contract between a city and a water company that the rental for water should be increased by the amount of any city tax on the company's property or works necessary for the supply of water was not an exemption of the property or works from city taxation; and hence the right to such increased rental passed to another company with which the contracting company subsequently merged or consolidated.—Supreme Court of Appeals of Virginia, 78 S. E. R., 651.

#### Public Improvements—Benefits.

*City of Seattle v. Gatton et ux.*—Where a street was widened by the taking of plaintiff's land, the eminent domain commission proceeded upon a fundamentally wrong basis when it is charged back against the remainder of appellant's land the amount of the condemnation award made by the jury and then assessed full benefits on the remainder; for the verdict of the jury as to the amount of damages in the condemnation proceeding is conclusive.—Supreme Court of Washington, 136 P. R., 488.

#### City Attorney—Employment—Authority.

*City of Charleston et al v. Little Page, Judge, et al.*—Where the board of affairs of a city had power to make a verbal contract with an attorney to represent the city, the failure of the board's record to disclose an order, resolution, or entry of such employment did not disprove its existence in an action wherein the attorney appeared to represent the city; the presumption being in favor of an attorney's employment where he appears in behalf of a client.—Supreme Court of Appeals of West Virginia, 80 S. E. R., 131.

#### Bond Election—Notice—Injunction.

*City of Miami et al v. Romfh et al.*—A statutory requirement that notice of a special election to authorize the issue of municipal bonds shall be published "once a week for a period of thirty days" is not complied with where the first publication is on March 26, and the last publication is on April 16, following; and such a publication is a valid ground for enjoining the issue of the bonds, where the statute makes the publication of the notice "once a week for a period of thirty days" a prerequisite to the issue of the bonds.—Supreme Court of Florida, 63 S. R., 441.

#### Petition for Paving—Acts of Corporate Officer.

*Pasche et al. v. South St. Joseph Town Co. et al.*—Where a land corporation instructed its president and secretary to attend to all business of the company and placed the practical management of the business in the secretary's hands, the majority of the directors being non-residents, the signing of the corporation's name to a petition for street paving by the secretary is binding on the corporation; it appearing that it was the general course of business to allow the secretary to sign such petitions.—Kansas City Court of Appeals, Missouri, 161 S. W. R., 322.

#### Icy Sidewalk—Defense.

*Livingston v. City of St. Joseph et al.*—Where a city allowed a hydrant to leak so that the water ran over the sidewalk and formed slush with newly fallen snow, which froze unevenly and caused plaintiff to fall, it cannot escape liability on the ground that the snow was a condition caused by the elements existing over a large territory, the injury being caused by the leak of the water.—Kansas City Court of Appeals, Missouri, 161 S. W. R., 304.

#### Care of Streets—Removing Gravel.

*City of La Grange v. Brown et al.*—Even though the abutting owner owns the fee of the street, the city is entitled to remove soil or gravel therefrom when necessary to properly grade it, and to use the gravel or soil in improving the streets in another locality.—Court of Civil Appeals of Texas, 161 S. W. R., 8.

#### Assessments—Power to Levy.

*City of Delta v. Lamb.*—The power of a municipality to levy assessments depends upon the express provisions of the charter or general statute, and hence a municipality cannot, without an express grant of power, levy assessments on property which merely abuts on streets carrying water or gas mains.—Supreme Court of Colorado, 136 P. R. 77.

#### Defects in Streets—Street Railroad.

*City of Astoria v. Astoria & C. R. R. Co.*—A city failing to perform its full duty by not requiring a street railroad to construct and maintain approaches to a crossing sufficient to protect the public, and in not seeing that proper barriers were placed along the tracks where injury was possible, was liable to a traveler, who in the exercise of due care was injured in consequence thereof.—Supreme Court of Oregon, 136 P. R., 645.

#### Contract—Validity of Award—Proposal.

*Johnson v. Atlantic City et al.*—A proposal for bids which specified that an addition would be made to each bid equal to \$50 for each working day the bidder proposed to take to complete the work; held not to comply with P. L. 1912, and the contract let was invalid; it being essential that the proposal submitted leave nothing to the bidders except to submit the price at which they will do the work.—Supreme Court of New Jersey, 88 A. R., 950.

#### Defect in Street—Unexploded Blast.

*Wilton v. City of Spokane et al.*—An independent contractor constructing streets for a city, who negligently leaves an unexploded blast beneath the surface of the street, is liable to one injured by a subsequent explosion thereof, even though the city has accepted the street; since this was not a defect arising from negligent construction of the street, but a negligent act collateral to his contract, so imminently dangerous as to make him liable, regardless of any contractual relation with the person injured.—Supreme Court of Washington, 132 P. R., 404.

#### Street Improvements—Sufficiency of Notice.

*Dyer et al v. City of Bandon et al.*—Under charter provisions that improvements should not be undertaken without ten days' notice thereof by publication in some city newspaper, specifying with convenient certainty the street or part thereof proposed to be improved and the kind of improvement proposed, a published notice that the city council had ordered Sixth street improved from the west line of Broadway, thence west, including therein Randolph avenue to the east line of West Bandon, such improvement to consist of grading, sidewalks, and flumes, was invalid for want of a certain description of the proposed improvement and gave the council no jurisdiction to complete it.—Supreme Court of Oregon, 136 P. R., 652.

#### Regulating Plumbers—Discrimination.

*Mayor and Aldermen of City of Vicksburg v. Mullane.*—An ordinance required every applicant for a license as a plumber to pass an examination as to his skill in plumbing, and to satisfy the board "that the applicant, or at least one resident member of the firm, or one resident executive officer in the corporation making the application, is a master plumber, \* \* \* who will give his personal attention to the work, also that the applicant will employ only competent help, and is financially responsible." Held, that the ordinance was invalid as unlawfully discriminating against individuals in favor of firms or corporations by permitting persons employed by the latter to do plumbing without an examination, providing one member of the firm is a licensed plumber, while requiring all individual plumbers to be qualified licensed plumbers.—Supreme Court of Mississippi, 63 S. R., 412.



## NEWS OF THE SOCIETIES

### Calendar of Meetings.

JANUARY 15-16.

COLORADO GOOD ROADS ASSOCIATION.—Annual Meeting, Colorado Springs. Thomas J. Ehrhart, State Highway Commissioner, Denver, Col.

January 16.

AMERICAN SOCIETY OF ENGINEERING CONTRACTORS.—Annual meeting, New York City. J. R. Wemlinger, Secretary, 11 Broadway, New York City.

January 19.

MONTANA INSTITUTE OF MUNICIPAL ENGINEERS.—Second annual meeting, Great Falls. Carl J. Widener, Secretary, Bozeman.

January 20-22.

AMERICAN WOOD PRESERVERS ASSOCIATION.—Tenth annual convention, New Orleans, La. F. J. Angier, Secretary, Timber Preservation Company, Baltimore, Md.

January 21.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—Annual meeting, New York. Chas. W. Hunt, Secretary, 220 West 57th street, New York City.

January 21.

TENNESSEE MUNICIPAL LEAGUE.—Second annual meeting, Maxwell House, Nashville, Tenn. John W. Horton, Secretary, Tullahoma.

January 21-23.

AMERICAN SOCIETY OF HEATING AND VENTILATING ENGINEERS.—E. A. Scott, Secretary, 29 West 39th street, New York City.

JANUARY 22-24.

INDIANA ENGINEERING SOCIETY.—Annual Meeting, Hotel Severin, Indianapolis, Ind. Charles Brossman, Secretary, 1616 Merchants Bank Building, Indianapolis, Ind.

JANUARY 26-28.

TEXAS GOOD ROADS ASSOCIATION.—Annual Meeting, Fort Worth, Tex.

January 27-29.

AMERICAN ELECTRIC RAILWAY ASSOCIATION.—Mid Year Meeting and Banquet, New York, N. Y. E. B. Burritt, Secretary-Treasurer, Engineering Societies' Building, 29 West 39th Street, New York, N. Y.

January 29-31.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Annual meeting, Montreal, P. Q. Prof. C. H. McLeod, Secretary, 176 Mansfield street, Montreal, Canada.

February 12-13.

SOUTHEASTERN SANITARY ASSOCIATION.—Second annual meeting, Columbia, S. C. Dr. James A. Hayne, President, Columbia, S. C.

February 12-14.

NATIONAL CONFERENCE ON CONCRETE ROAD BUILDING.—Auditorium Hotel, Chicago, Ill. J. P. Beck, Secretary, 72 West Adams St., Chicago, Ill.

February 16-20.

NATIONAL ASSOCIATION OF CEMENT USERS.—Fourth Annual Convention, Chicago, Ill. Edward E. Krauss, Secretary, Harrison Building, Philadelphia, Pa.

February 26-27.

INDIANA SANITARY AND WATER SUPPLY ASSOCIATION.—Seventh annual meeting, Hotel Severin, Indianapolis, Ind. Dr. W. F. King, Secretary, Indianapolis.

### New England Water Works Association.

The annual meeting was held at Hotel Brunswick, Boston, January 14. The following papers were presented: 2.00 o'clock P. M.—Paper, "The Construction of Dams," by A. E. Walden, Supt. and Chief Engineer, The Baltimore County Water & Electric Company, Baltimore, Maryland.

The following progress reports were received from committees:

"To prepare a Standard Specification for Fire Hydrants." H. O. La-count, George A. Stacy, Frank A. McInnes, Frederick W. Gow, William F. Sullivan.

"To look after and keep track of Legislation and other matters pertaining to the Conservation, Development and Utilization of the Natural Resources of the Country." M. N. Baker, William T. Sedgwick, Leonard Metcalf, Allen Hazen, George A. Soper.

"To collect information as to Low

Water Yields of Catchment Areas in New Eng'and, and at their Discretion, Outside of New England." Frederic P. Stearns, Arthur T. Safford, Richard A. Hale, Harold K. Barrows, C. E. Chandler, X. H. Goodnough, James L. Tighe, Leonard Metcalf, Elbert E. Lochridge, George A. Carpenter.

"Meter Rates." Allen Hazen, Chairman, A. W. Cuddeback, J. L. Tighe, A. E. Blackmer, C. R. Bettes, Philander Betts.

"Statistics of Water Purification Plants." George C. Whipple, F. D. West, Robert S. Weston, Frank W. Green, E. E. Lochridge.

"Secure Legislation to Make Water Bills a Lien on Property." John O. Hall, Frank A. McInnes, George A. King, Robert J. Thomas, A. R. Hathaway.

"Standart Specification for Cast Iron Pipe." F. A. McInnes, Dexter Brackett, W. R. Conard, F. A. Barbour, George A. King.

### National Conference on Concrete Road Building.

The tentative program for the meeting at the Auditorium Hotel, Chicago, February 12 and 14, has been announced as follows:

#### THURSDAY.

9 A. M.—Reception and registration of delegates and visitors. Committee Meetings.

2 P. M.—W. F. M. Goss presiding. "The National Conference on Concrete Road Building," W. F. M. Goss, Dean, College of Engineering, University of Illinois, Urbana, Ill. "Financing Permanent Roads," F. S. Bradt, Secretary, Illinois State Highway Commission, Springfield, Ill. "Can a Rural Community Afford Permanent Roads?" Oliver Dunlap, President, Iowa State Supervisors Association Chairman Board of Supervisors, Washington County, Ia. "The Concrete Road System of Wayne County, Michigan," Edward N. Hines, Chairman, Board of County Road Commissioners, Wayne County, Michigan.

#### FRIDAY, FEBRUARY 13TH.

10 A. M.—A. N. Johnson presiding. "Development of Concrete Roads in the United States," Henry C. Shirley, Chief Engineer, Maryland State Roads Commission, Baltimore, Maryland.

Reports of Committees: "Contraction and Expansion of Concrete Roads," Chairman, R. J. Wig, Bureau of Standards, Department of Commerce, Washington, D. C.; N. H. Tunnicliff, Civil Engineer, Davenport Iowa; W. A. McIntyre, Engineer, Ass'n of American Portland Cement Mfrs., Philadelphia, Pa. "Joints for Concrete Roads," Chairman, W. K. Hatt, Professor in Charge, School of Civil Engineering, Purdue University, Lafayette, Ind.; George W. Cooley, State Engineer, St. Paul, Minnesota; R. J. Wig, Bureau of Standards, Department of Commerce, Washington,

D. C. "Methods and Cost of Repairing and Maintaining Concrete Roads," Chairman, Edward N. Hines, Chairman Board of County Road Commissioners, Wayne County, Detroit, Mich.; J. S. McCullough, City Engineer, Fond du Lac, Wis.; F. P. Wilson, City Engineer, Mason City, Iowa. "Preparation and Treatment of Sub-Grade for Concrete Roads," Chairman, Ira O. Baker, Prof. of Civil Engineering, University of Illinois, Urbana, Illinois; A. R. Hirst, State Highway Engineer, Madison, Wisconsin; A. N. Johnson, State Highway Engineer, Springfield, Illinois. "Reinforcement of Concrete Roads," Chairman, Thomas H. McDonald, State Highway Engineer, Ames, Iowa; Henry E. Riggs, Professor of Civil Engineering, University of Michigan, Ann Arbor, Michigan; Richard L. Humphrey, President American Concrete Institute, Philadelphia, Pa.

2 P. M.—Ira O. Baker presiding. "Experiments with Concrete for Roads Conducted by the United States, Office of Public Roads," Logan Waller Page, Director, United States Office of Public Roads, Washington, D. C.

Reports of Committees: "Aggregates for Concrete Roads," Chairman, Sanford E. Thompson, Consulting Engineer, Newton Highlands, Mass.; A. N. Talbot, President, American Society for Testing Materials, Urbana, Illinois; W. M. Kinney, Assistant Engineer, Universal Portland Cement Co., Pittsburgh, Pa. "Shoulders for Concrete Roads," Chairman, Major W. W. Crosby, Baltimore, Maryland; C. A. Kingsley, State Highway Engineer, Little Rock, Ark.; John H. Mullen, Secretary, Minnesota Roadmakers' Association, St. Paul, Minn. "Bituminous Surfaces for Concrete Roads," Chairman, E. J. Mehren, Editor-in-Chief, Engineering Record, New York City; Henry G. Shirley, Chief Engineer, State Roads Commission, Baltimore, Ind.; James R. Marker, State Highway Commissioner, Columbus, Ohio. "Finishing and Curing concrete Road Surfaces," Chairman F. E. Turneure, Dean College of Engineering, University of Wisconsin, Madison, Wisconsin; H. J. Kuelling, President, Wisconsin Highway Commissioners' Association, Milwaukee, Wisconsin; E. D. Boyer, Engineer, The Atlas Portland Cement Co., New York City. "Economic Methods of Handling and Hauling Materials for Concrete Roads," Chairman, Halbert P. Gillette, Editor-in-Chief, Engineering & Contracting, Chicago; Donald D. Price, State Engineer, Lincoln, Neb.; Percy H. Wilson, Secretary, Association of American Portland Cement Mfrs., Philadelphia, Pa.

#### SATURDAY, FEBRUARY 14TH.

2 P. M.—W. F. M. Goss presiding. "Concrete Road Construction by the Ohio State Highway Department," James R. Marker, State Highway Commissioner, Columbus, Ohio. Reports of Committees: "Mixing and Placing Materials for Concrete Roads," Chairman, Paul D. Sargent, Chief Engineer,

State Highway Commission, Augusta, Maine; Arthur H. Blanchard, Professor of Highway Engineering, Columbia University, New York City; C. W. Boynton, Inspecting Engineer, Universal Portland Cement Co., Chicago. "Cost of Constructing Concrete Roads;" Chairman, A. N. Johnson, State Highway Engineer, Springfield, Illinois; Joseph Hyde Pratt, State Engineer, Chapel Hill, N. C.; Albert Reichmann, President, Western Society of Engineers, Chicago. "Thickness, Crown and Grades for Concrete Roads;" Chairman, Leonard C. Smith, in charge of roads and pavements, University of Wisconsin, Madison, Wisconsin; Earle R. Whitmore, City Engineer, Port Huron, Michigan; T. R. Agg, Assistant Professor in Civil Engineering, Iowa State College, Ames, Iowa. "Proportion and Consistency of Materials for Concrete Roads;" Chairman, C. U. Bowley, City Engineer, Sheboygan, Wis.; C. C. Widener, City Engineer, Bozeman, Mont.; George A. Dingman, Engineer, Board of County Road Commissioners, Wayne County, Detroit, Mich. "Form of Specifications for Concrete Roads;" Chairman, A. Marston, Dean and Director, Division of Engineering, Iowa State College, Ames, Iowa; A. N. Talbot, President, American Society for Testing Materials, Urbana, Illinois; George W. Cooley, State Engineer, St. Paul, Minn.

## PERSONALS

Ashburner, Charles E., formerly general manager of Staunton, Va., has been selected by the city commission to be city manager for Springfield, O. Chapman, William E., Dillon, Mont., has been appointed city engineer. Mr. Chapman has served as assistant for three years.

Drummond, M. J., New York, N.Y., after serving four years as commissioner of charities has resumed his active interest in the cast iron pipe trade. The offices of M. J. Drummond & Co. are 51 Chambers street, New York.

Kemper, Joseph, has been appointed city engineer of Utica.

Lewis, H. M., assistant engineer with M. J. Harding, consulting engineer, New York City, will sail for Germany this week, where he will be employed under Dr. Imhoff in the Emscher Gesellschaft.

Mitchel, John Purroy, mayor of New York City, has made the following appointments: City Chamberlain, Henry Bruere; Fire Commissioner, Robert Adamson; Commissioner of Correction, Miss Katherine Bement Davis; Commissioner of Charities, John A. Kingsbury; Commissioner of Street Cleaning, John T. Featherston; President Civil Service Commission, Henry Moskowitz; member Civil Service Commission, Darwin R. James, Jr.; president of Park Board, with immediate supervision of the parks of Manhattan and Richmond, George Cabot Ward; Commissioner of Parks, Brooklyn, Raymond V. Ingersoll; Commis-

sioner of Docks and Ferries, R. A. C. Smith; Tenement House Commissioner, John J. Murphy; President of the Tax Board, Lawson Purdy; Tax Commissioner, to succeed Daniel S. McElroy of Manhattan, Collin H. Woodward; Tax Commissioner, to succeed Judson G. Wall of Brooklyn, ex-Mayor Ardolph L. Kline; Commissioner of Bridges, Frederick J. H. Kracke; members of the Board of Assessors, Alfred P. W. Seaman, Jacob J. Lesser, and William C. Ormond.

Smith, August, who has served as city engineer of Stratford, Ont., Victoria, B. C. and Regina, Sask. has been made city engineer of Prince Albert, Sask.

Niagara Falls, N. Y.—Mayor Laughlin has made the following appointments: city clerk, Thomas H. Hogan; corporation counsel, F. G. Anderson; city engineer, F. S. Parkhurst; street superintendent, John Conroy; sealer of weights and measures, Roy B. Sutor; health officer, Dr. E. E. Gillick; board of public works, Charles J. Ohrt and John Lebherz; water commissioners, A. J. Porter, James F. Murphy, Walter McCulloh; industrial commissioners, G. H. Courter, John L. Harper; grade-crossings commissioners, Frederick Chormann, M. B. Butler, P. F. Jenss, G. G. Shepard; harbor commissioner, F. L. Lovelace; park commissioner, P. Schoellkopf, Nathan Hirsch.

Geneva, N. Y.—Mayor R. H. Gulvin has made the following appointments: board of public works, Horace K. Saybolt, Walter C. Ware; fire commissioners, Stewart F. Dey, Louis C. Isenman and Frederick W. Hadlow; police commissioner, Henry B. Graves.

Summerville, Ga.—Mayor, Col. C. D. Rivers, re-elected for sixth term.

Knoxville, Can.—Mayor Phillip Francis.

Pittsburg, Pa.—President Groning has announced the chairmen of the standing committees as follows: Finance, Robert Garland; public works, Dr. J. P. Kerr; service and surveys, Dr. S. S. Woodburn; filtration and water, W. A. Hoeveler; parks and library, Enoch Rauh; public safety, G. A. Dillinger; corrections, John S. Heron; health and sanitation, W. Y. English.

Lexington, Ky.—Mayor and commissioner of public affairs, J. E. Cassidy; vice-mayor and commissioner of public property, James T. McCarty; commissioner of public safety, Waller B. Hunt; commissioner of public finance, Keeling G. Pulliam; commissioner of public works, Christopher H. Wilkerson.

Haverhill, Mass.—City clerk, William W. Roberts; city solicitor, Ransom C. Pingree; inspector of wires, Woodbury E. Corson; mayor's clerk, Albert K. Johnson; superintendent of moths, Michael J. Fitzgerald; superintendent of street lights, Stephen W. Howe.

Pittsfield, Mass.—Joint standing committee: Finance, Mayor Moore, Aldermen McMahon and Milnes, Councilmen Langley, Iverson Berard and Fahey; fire department, Aldermen

Fahey and Milnes, Councilmen Langley, Retallick and Fahey; fuel and street lights, Aldermen McEneaney and Moulton, Councilmen Retallick, McCarthy and Gray; highways, bridges and culverts, Aldermen Fahey and Devanny, Councilmen Nixon, Dunn and Dodge; public properties, Aldermen Devanny and Moulton, Councilmen Langley, Dodge and McCarthy. The standing committees of the board of aldermen are: electric wires, Aldermen McEneaney and Francis; police, Mayor Moore, Aldermen Fahey and Francis.

Scranton, Pa.—City planning commission: A. J. Casey, chairman; John R. Thomas, secretary.

Louisville, Ky.—Park board, committee on contract and supplies, Commissioners Levy, Seelbach and Castleman.

Windustel—Mayor D. J. Matlack has appointed the following committee of council: light and water committee, Brown, Nunan and Scrivener; sewers, Dinelli, Nunan and Brown; sidewalks, Dinelli, Renaker and Scrivener; fire and police, Renaker, Gilbert and Nunan.

Ithaca, N. Y.—Mayor Thomas Tree has announced the following committees for the new council: finance, Gibb, Burns, Stilwell, Nadge and Carpenter; police department, Stilwell, Patmore and Wilkinson; relations with board of public works, Burns, Perkins and Patmore; relations with fire commission, Nadge, Wilkinson and Perkins; relations with board of health, Carpenter, Pearson and Barnes.

Watertown, N. Y.—Mayor Breen has made the following appointments: city attorney, Harold L. Hooker; city treasurer, Frank Walts; city clerk, Fred W. Streeter; city engineer, Earl W. Sayles; sealer weights and measures, Frank E. Martell; commissioner of public works, Morris Griffin; commissioner of water works, John C. Knowlton; commissioner of public safety, Frank L. Moore; commissioners of health, Percy H. Willmott and William P. Darby, for the unexpired term of Harold L. Hooker.

Fulton, N. Y.—Board of Public Works, John W. Stevenson, Frederick G. Spencer and Lewis E. Garrett. City engineer, C. Clayton Hill, reappointed. F. D. Rumsey, superintendent of public works.

Dunkirk, N. Y.—Mayor H. B. Lyon has made the following appointments: city engineer, William H. Shelton; police and fire commissioner, William H. Brophy; street commissioner, Charles F. Link.

Dayton, O.—City manager, Henry M.

Waite has made the following appointments: Director of welfare work, Dr. D. Frank Garland; director of public service, James E. Barlow; director of finance, Hugh Wall; clerk of commission, John Harshman.

Portsmouth, Va.—City engineer, Joseph F. Weaver.

Rochester, N. Y.—Commissioner of public works Herbert W. Pierce has appointed Armour S. Lloyd, formerly superintendent of sewer repairs, as his deputy.



# NEW APPLIANCES

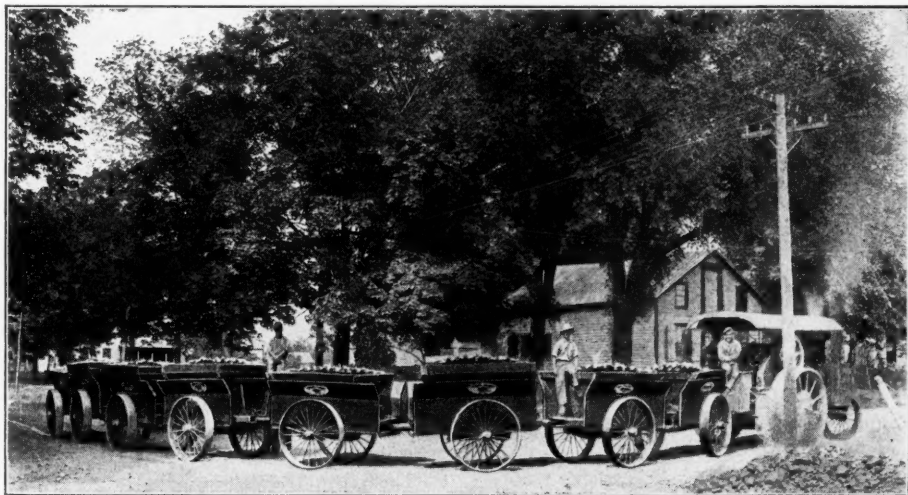
## TRACTION TRAIN.

### Eagle Company Makes Two Wheeled Cars for Traction Trains and Use as Trailers.

The Eagle Wagon Works of Auburn, New York, exhibited with their regular dump wagon at the Good Roads show in Philadelphia last month, a two wheel trailer, something entirely new in the kind of a vehicle, for the carrying of crushed stone or other material to be hauled behind the traction engine or auto tractor. This trailer consists of a number of two wheel carts or cars, so connected that they are perfectly flexible, fitting themselves easily to the contour of the road. Ease in action is one of the merits claimed. The capacity of the cars is two, three or three and a half yards each. The simplicity of the design makes their cost reasonable.

The bodies and the wheels are of steel construction. The wheels have eight inch tires. The axles are of straight steel carried on roller bearings. As compared with pivoted axles this feature is claimed to give ease of traction.

These cars have gone through the experimental stages. The Eagle Wagon Works of Auburn, N. Y., have had out several trains this past summer and all reports regarding the utility, durability and general fitness for a trailing outfit have been pleasing to the manufacturers. The coupling of these cars to prevent them from tipping and to keep the train steady so that each car or cart follows the preceding one, is very simple and ingenious. The picture shows a train of eight of these carts making a sharp turn in the road. Four of them are 3 yard capacity and the rest 3½ yard capacity. The draft is very light owing to the flexibility of the train, roller bearings of the wheels, and the general simplicity of the entire outfit.



EAGLE TRACTION TRAIN.

## OWEN CLAMSHELL BUCKETS.

### Owing to Great Digging Power Are Favorites with Sewer Contractors.

The Owen Bucket Co., Rockefeller Building, Cleveland, O., manufacture the Owen clamshell bucket. The three most essential features of a material-handling bucket are: Ability to dig



OWEN BUCKET.

into the material and fill itself; quick operation, so as to give the maximum number of trips; durability resulting from strong construction; and few wearing parts. These buckets operate on either the block and tackle or the purchase principle. It may be so rigged that seven times the power

of the upward pull of the closing line can be applied to the jaws which dig into the material. When so much digging power is not required, a simpler rigging causes it to operate quicker. With the block and tackle principle the lifting tendency is reduced to a minimum and does not increase as the bucket closes.

In every bucket the lifting tendency exerted by the closing line must be overcome, to some extent, by a certain amount of weight, and the bucket which utilizes all of this weight, when in operation, gives maximum digging efficiency with greatest economy at all times. To utilize this weight it should be placed in the center of the construction when the bucket is open—on the main shaft. The Owen bucket has counterweights around the main shaft. The digging power can be increased or decreased by varying the counterweights. As the counterweights supply the digging power, all unnecessary weight is eliminated from the other parts of the bucket. The shape of the shell is designed to act like a spade when entering the material.

Another feature of the Owen clamshell is the skewed blocks. They bring the on-running and off-running portions of the closing line cable substantially in the center plane of the bucket, so that the upward pull never varies from direct center and a perfect balance is obtained. All cables are reeved over large sheaves and do not come in contact with the material.

Some details of construction are worth considering. The bottom plates of the large-size shells are reinforced with a heavy steel plate riveted between two angle irons in the center of each half of the shell. The cutting plates are detachable. Manganese steel lips are recommended for use in materials which are hard on the cutting edge. The crosshead is steel, cast in one piece. The guide arms of the head have self-lubricating bronze bushed guide sheaves and side rollers. The hinges are heavy cast-steel ribs, having stops to prevent the bucket from turning inside out.

## WATER HEATER.

### Facilitates Concreting in Freezing Weather.

The Warner-Reiss Sales Company, 601 Frisco Building, St. Louis, Mo., has placed on the market a device which should be a great convenience, if not an absolute necessity for a contractor who is laying concrete in winter. The Starwell Class B water heater, as the device is called, consists of a conical outer shell, inside of which is a perforated cone. The water enters at the side of the outer shell, forming a thin wall of water around the cone. Steam enters this wall of water through the perforations in the cone. In this

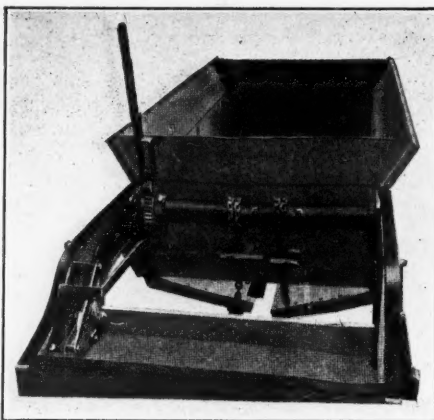
way the water is heated, practically instantaneously, to any desired temperature, dependent upon the volume of the steam admitted. The temperature of the water can be maintained at any desired degree or changed at will, it is stated.

The heater is made of cast iron, the inlets and discharge being  $1\frac{1}{4}$  inches. To install this device on a mixer all that is necessary to do is to make steam and water connections with a valve on each. The discharge is free into the measuring tank of the mixer. After a little practice where work is going on steadily the valves may be so adjusted that the apparatus requires little or no attention. The manufacturers claim that the device is much more economical as a heater than the methods commonly employed, as every unit of heat in the steam is transferred to the water. The heater has been used by a number of large contractors in St. Louis and vicinity.

### CHAMPION WAGON.

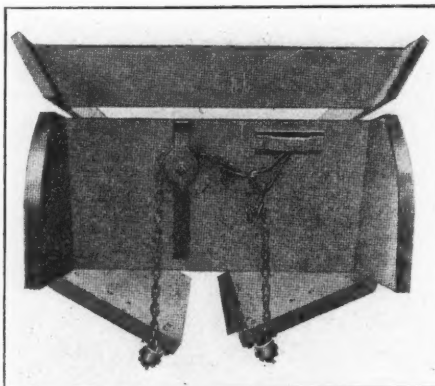
**Equalizer Closes One Door 3 Inches Ahead of Other—Dumping Mechanism Has Forged Steel Parts.**

The Champion Wagon Co., Oswego, N. Y., who have been making high-grade wagons for thirty years, build a contractor's bottom dumping wagon under the trade name Champion. One of the features of the wagon is a patented equalizer shown in the illustration, which closes the right hand door at least three inches ahead of the other. This makes it possible to put a strip of steel the entire length of the door which makes it sand tight. The hinges of the doors are wrought iron. The dumping and winding mechanism has few parts. The drum is large enough to make necessary but few motions of the hand to close the doors. The handle, dog, lever and lever lock are all of forged steel. There is a positive lock on the



FRONT—SHOWING WINDING DEVICE.

foot trip which prevents the load from being accidentally dumped. Along the edges of both doors through the centre of the wagon are strips of 2x4-in. oak. This prevents the doors from springing, and when the doors are



REAR—SHOWING EQUALIZER.

dropped, the strips by hitting against the tires, prevent the doors or chains from coming in contact with the spokes of the wheels. The webbed goose necks inside and out, together with the bracing, form a strong front end.

These wagons are built  $1\frac{1}{2}$ , 2 and 3 cu. yd. capacities. The specifications for the  $1\frac{1}{2}$ -cu. yd. wagon are:

Body—Selected, thoroughly air seasoned, second growth white oak and ash,  $1\frac{1}{2}$  ins. thick. Edges of both body and upper box are banded with steel to protect from shovels and materials.

Axles—Solid steel, square bed, front 2x10, rear  $2\frac{1}{2}$ x10.

Wheels—Front 3 ft., rear 4 ft. Hubs, seasoned Pennsylvania black birch, carefully mortised and heavily banded.

Spokes—Second growth white oak "A" grade.

Rims—XXX grade second growth white oak bent to a true circle.

Tires—3x5-8 or 4x5-8, highest quality steel.

Track—Either regular narrow track, 4 ft. 6 in. or regular wide track, 5 ft. These measurements are from centre to centre of tires, on the ground. Other special tracks built.

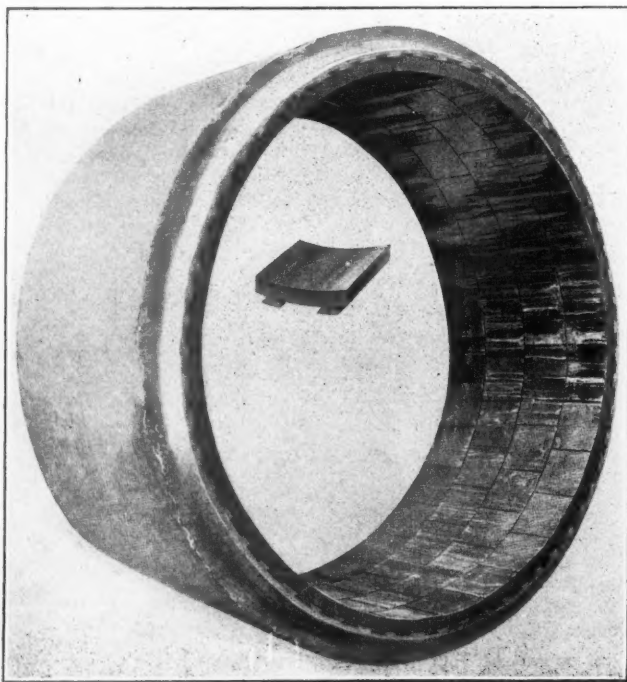
Pole—Either drop tongue with neck-yoke or stiff tongue with chains. Spreader of Boston Backers furnished if ordered.

Height—To top of body, 4 ft. 2 in., to top of flare boards, 4 ft. 8 in.

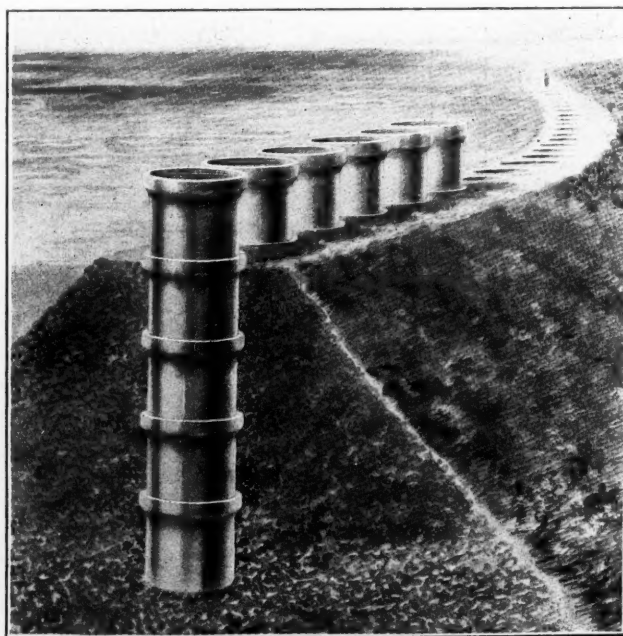
Weight—About 1,800 pounds.

### Special Uses of Clay Products.

Blackmar & Post, St. Louis, Mo., manufacturers of sewer pipe and clay products, do more than make standard goods and are originators of new ceramic materials and processes. One of their specialties is a vitrified block for lining large concrete sewers. The face of the blocks conforms to the radius of the sewer and the back has two lugs to give it a strong hold to the concrete. A new use suggested for standard sewer pipe is illustrated. The sewer pipe are a reinforcement to a levee and besides afford a means for rapidly building up the levee in case of a sudden rise of the river. The manufacturers state that this is a very promising development in the field of flood prevention.



CONCRETE PIPE LINED WITH CLAY BLOCKS.



LEVEE MADE WITH AID OF SEWER PIPES.



## INDUSTRIAL NEWS

**Cast Iron Pipe.**—Chicago. Inquiry for pipe for municipal use is much improved. Quotations: 4-inch, \$27; 6 to 12-inch, \$25; 16-inch and up, \$24. Birmingham. There is a better feeling among pipe makers although prices are low. Quotations: 4-inch, \$22; 6-inch and up, \$20. New York. Recent bids at Worcester, Mass., and Brooklyn, N. Y., are somewhat higher than those at which some recent contracts were placed. Private buyers are placing larger orders than a year ago. Quotations: 6-inch, \$22 to \$23.

**Lead.**—Market is dull and weak. Quotations: New York, 4.15c; St. Louis, 4.05c.

**Cement Machinery.**—The Waterloo Cement Machinery Corporation, Waterloo, Ia., manufacturers of the "Little Wonder" concrete mixer did a good year's business in 1913.

Although extensive additions and facilities for manufacture were made when it was supposed all needs had been covered for years to come, it has been necessary to again increase the area of the factory and to erect a large storage house for raw material. Likewise there is now being installed, against the demands of the coming season, new machinery which includes large lathes, and bending machines of great power. These will not only largely increase the capacity of the plant, but in many ways add to the strength and general value of the mixer. One of the most gratifying things in the experience of the corporation is the enlarged opportunities the Little Wonder "Five" has brought to the small contractor. Orders for additional machines from old customers are daily bringing to light the fact that many heretofore small contractors are operating several Little Wonder "Fives" on various jobs, and that instead of laboriously pushing a hoe on a mixing board for a single job, they are now supervising several crews of men from automobiles.

**Engineering Chemists.**—The firm of Pullar & Enzenroth, Engineering Chemists, Detroit, Mich., has been reorganized, and in future will be known as the H. B. Pullar Co., Engineering Chemists. T. C. Ford, B. S., Ch.E., A.M., formerly chief chemist for the American Asphaltum & Rubber Co. of Chicago, will become an active member of the new firm. Mr. Ford has for the last five years been closely associated with Mr. Pullar, and is thoroughly familiar with the testing of bituminous materials, and has had a wide experience in the actual building of many miles of roads and pavements throughout the United States and Canada. Mr. Ford was one of the first four engineers to graduate from the special post-graduate course of Highway Engineering of Columbia University, New York City. The new firm will continue its business of testing asphalts, water-proofing, bitumens, oils and paints, and the inspection of roads and pavements. Will also be in position to draw up specifications and

supervise construction of pavements, roads, bituminous floors and bituminous sidewalks. The new plan for road and paving inspection which was devised by Mr. Pullar last year, will be considerably elaborated upon, and members of the firm believe that this plan for the inspection of roads and pavements, the testing of materials entering into them and the keeping of detailed records, will be of great interest to engineers and other officials interested in highway work. The new firm will retain its location at 378 Woodward Avenue, Detroit, Mich.

**Road Drag.**—The Miller Road Drag and Supply Company has opened offices in the Observatory Building, Des Moines, Ia. The factory at present is located in Des Moines. Prospects state that the factory may be removed to Des Moines and other road machinery added to the line. The drag is constructed without levers. Claims are made that it not only fills the holes in the road but packs the dirt. From two to four thousand drags a month are said to be made in Muscatine. The Des Moines office will be in charge of M. V. Kennedy, Jr. Among the officers of the company are H. A. Miller of Wapello, who introduced the Miller drag; J. L. Helsing, W. G. Kennedy and R. G. Weiser of the Iowa Pure Iron Culvert company, and David B. Long of Osceola.

**Noiseless Brakes.**—All street railroad companies operating surface cars within the City of New York have been ordered by the Public Service Commission for the First District to equip their cars with brake shoes having a lubricant insert or with some other equally efficient device for reducing noise on or before March 1, 1915; and the companies must submit such devices for the Commission's approval by September 1, 1914. The order is intended to stop the "squealing" of street car wheels. This is the noise made by the friction of wheel flanges against the ball of the rail, particularly when the brakes are applied. The companies are now experimenting with brake shoes containing inserts of material which lubricate the flange of the wheel and thereby lessens the friction which causes "squealing." The order was made effective March 1, 1915, in order to give the companies time to complete their tests of the new brake shoes.

**Pumps.**—Plans are being prepared by the Rumsey Company, Ltd., manufacturer of pumps, etc., Seneca Falls, N. Y., for an additional factory building upon a site recently purchased.

**Hydraulic Ram.**—The Harrisburg Machinery Company, 36-38 North Third street, Harrisburg, Pa., has been incorporated with a capital stock of \$20,000 to take over the hydraulic ram business formerly conducted by Charles H. Drawbaugh & Co. S. R. Satterthwaite is president; J. T. Olmstead, vice-president; I. P. Bowman, secretary, and L. D. Perry, treasurer. The present plant will be operated and no extension will be made at the present time.

**Diesel Engine.**—The American Krupp-System Diesel Engine Company, 165 Broadway, New York City, which was incorporated last fall with a capital stock of \$10,000,000, is seeking a site for a factory. Preference will be given to a city between New York and Norfolk, Va., on the Atlantic seaboard. Louis H. Dos Passos, John R. Dos Passos and Charles H. Starbuck, president of the New York Air Brake Company, are interested. John L. Bogert is the engineer. Officers have as yet not been chosen.

**Road Machinery.**—The Galion Iron Works & Mfg. Company, Galion, Ohio, which has succeeded the Galion Iron Works Company, has completed its organization by the election of D. C. Boyd, president; F. W. Faber, vice-president, and F. W. Biehl, secretary and treasurer. The new company will have \$500,000 in preferred stock and \$500,000 in common stock. A large addition to the plant is being designed and will probably be started in a few weeks.

**Concrete Piles.**—The MacArthur Concrete Pile & Foundation Co., 11 Pine street, New York, N. Y., has been awarded a contract as follows: foundation of the retort building for the New Haven (Conn.) Gas Light Company. About 600 Pedestal Piles will be driven. This contract also covers reinforced concrete slab and walls. Robert E. Wyant, engineer for Gas Company. Contract covering the concrete pile and reinforced mat foundation for the Brockton Gas Light Company's new gas holder, Brockton, Mass. The Bartlett Hayward Co., contractors, Baltimore Md., contract covering foundations for the White Service Co. improvement on 57th street, near 12th avenue, New York City. George F. Pawling & Co., engineers and contractors, Philadelphia.

**Paving Brick.**—The Thornton Fire Brick Company, Clarksburg, W. Va., are building a new plant and expect to have the work so far along that they can resume operations by February 1. General Manager D. R. Potter received a silver service as a Christmas present from his employees, as testimony of the good feeling that has always existed between the management and the employees.

**Industrial Railways for Road Work.**—The San Francisco office of the Orenstein-Arthur Koppel Company reports that 1913 has been the best year in the history of the office, the business of the last three months being especially satisfactory. This company has taken a contract for 7,000 feet of portable track and 13 standard dump cars for state highway work near Fresno, Cal., this being the tenth order of the kind taken for the state highway. It is estimated that only about one-third of the requirements of this work have been filled so far. Three carloads of portable track and two of dump cars have been sold for road work at Los Alamos, Cal.

# ADVANCE CONTRACT NEWS

## ADVANCED INFORMATION BIDS ASKED FOR

## CONTRACTS AWARDED ITEMIZED PRICES

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also correction of any errors discovered.

### BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
<b>STREETS AND ROADS</b>				
Fla.	St. Petersburg	Jan. 19	Grading, curbing and paving	Bd. Comrs.
Ala.	Montgomery	Noon, Jan. 19	Grading 2½ miles road	T. H. Edwards, Co. Engr.
Mont.	Great Falls	8 p.m., Jan. 19	Concrete curbing and sidewalks for 1914	W. H. Harrison, City Clk.
La.	Sac City	Jan. 19	Paving, various materials; 5-inch concrete base	W. F. Weary, City Clk.
Cal.	San Diego	2 p.m., Jan. 19	Construction county highway	T. J. Butler, Clk. Bd. Co. Supv.
Wash.	North Yakima	Jan. 19	Paving and grading state highway	Co. Comrs.
Md.	Baltimore	Jan. 19	Constructing 5 sections of state highway	State Road Comr.
Pa.	Harrisburg	10 a.m., Jan. 19	Reconstruction of roads	State Highway Dept.
Ill.	Chicago	11 a.m., Jan. 19	Street and alley improvements	Bd. Local Imps.
Ala.	Anniston	11 a.m., Jan. 20	Grading and macadam surfacing, 1 mile road	W. S. Keller, State Hwy. Engr.
Mont.	Billings	Jan. 20	Paving	City Clerk.
Fla.	Ft. Myers	Jan. 20	Grading, paving 7½ miles street with shell	E. W. Sumner, City Clk.
N. M.	Roswell	Jan. 20	Paving, various materials, 16,079 yards	J. A. Gilmore, City Clk.
Md.	Baltimore	Jan. 21	Paving with vit. block and granite, 25,200 sq. yds.	J. M. Hedian, Sec. Bd. Awards.
Conn.	Hartford	Jan. 21	State road work in four towns	C. J. Bennett, St. Hwy. Comsn.
Ind.	Knox	2 p.m., Jan. 22	Paving, curbing, paving street	Twn. Bd. Trustees.
Ga.	Cordale	Jan. 22	40,000 to 50,000 sq. yds. pavement, various materials	Bond Committee.
La.	Morgan City	Jan. 23	Cement sidewalks, 29,032 sq. yds.; concrete and brick curbing, 1,570 ft.	M. D. Shannon, Mayor.
Ind.	Terre Haute	11 a.m., Jan. 24	Constructing national road	N. G. Wallace, Aud.
Kan.	Concordia	8 p.m., Jan. 26	Curbing, paving, guttering certain streets	City Clerk.
Cal.	Hemet	Jan. 26	Improving portions of streets	C. M. Dietterich, City Clk.
Fla.	St. Petersburg	Jan. 26	Paving, vit. block; curbing with granite, 75,000 feet	Bd. City Comrs.
Va.	Roanoke	Noon, Jan. 27	Macadamizing with binder; constructing concrete curb and gutter	W. L. Graft, City Clk.
La.	Lafayette	Jan. 27	Concrete sidewalk, 15 miles	E. L. Voorhees, City Engr.
Ind.	Noblesville	11 a.m., Jan. 29	Gravel road	G. A. Griffin, Co. Aud.
Fla.	Tampa	2 p.m., Jan. 30	Brick pavement, 216,187 sq. yds.; granite or vitrified brick curb, 147,840 lin. ft.	Co. Comrs.
N. Y.	Albany	1 p.m., Jan. 30	Highway improvement in about 18 counties	J. H. Carlisle, Comr.
Wis.	Fond Du Lac	Feb. 1	Cement paving, 3 miles	J. W. Forrester, Comr. Sts.
O.	Salina	Feb. 1	Macadam, 4 miles	R. D. Smalley, Co. Engr.
Ind.	Laporte	Feb. 1	Brick paving; cost, \$800	L. Drew, Engr.
Fla.	Jacksonville	Feb. 2	Laying asphaltic concrete pavement, 16,762 sq. yds.; vit. block pavement, 33,844 sq. yds.	Sec. Bd. Bond Trustees.
S. D.	Britton	3 p.m., Feb. 2	Constructing highway	H. M. Deer, St. Engr.
Kan.	Winfield	5 p.m., Feb. 2	Brick paving, 32,000 sq. yds.	W. C. Hale, City Clk.
La.	Monticello	8 p.m., Feb. 4	Paving, curb and gutter	C. J. Northrop, City Clk.
N. J.	Red Bank	8 p.m., Feb. 4	Street paving, 1,172 yds.	A. H. Harris, Boro. Clk.
N. J.	Alpha	2 p.m., Feb. 9	Constructing concrete curb and gutter	T. Pfeiffer, Ch. Str. Com.
La.	Waukon	Feb. 10	21,000 sq. yds. vit. brick pavement	J. T. Cowan, City Clk.
Ill.	Taylorville	Feb. 15	Nine miles brick pavement on concrete base, cost \$180,000	J. W. Dappert, Engr.
S. D.	Sioux Falls	9 a.m., Feb. 16	Paving	W. C. Leye, City Aud.
Tex.	Mineral Wells	Mar. 1	Macadam road; cost, \$55,000	G. S. Steward, Mayor.
<b>SEWERAGE</b>				
O.	Mt. Vernon	noon, Jan. 17	Sewage treatment plant; sanitary trunk sewer	R. S. Blinn, Dir. Pub. Serv.
O.	East Liverpool	Noon, Jan. 17	10-inch sanitary sewer	J. S. Wilson, Dir. Pub. Serv.
Ill.	Kankakee	2 p.m., Jan. 17	Tile and open ditches	Comrs. Union Drain. Dist. No. 6
S. D.	Yankton	Jan. 19	Lateral sewers	City Auditor.
Neb.	Bancroft	8 p.m., Jan. 19	Sewer; estimated cost, \$20,000	C. E. Barnes, Vil. Clk.
Okla.	Atoka	8 p.m., Jan. 19	Sanitary sewer system; est. cost, \$30,000	P. T. Williamson, City Clk.
Fla.	Ft. Myers	8 p.m., Jan. 20	Storm and sanitary sewers	E. W. Sumner, City Clk.
Ill.	Berwyn	8 p.m., Jan. 20	Vit. tile pipe sewer	Bd. Loc. Imps.
Ind.	South Bend	10 a.m., Jan. 20	Pipe sewer	A. P. Perley, Clk. of Bd.
La.	Muscatine	1 p.m., Jan. 22	Drainage pumping plant	Suprv. of County.
N. Y.	Scarsdale	2 p.m., Jan. 22	Sewerage system, 82,000 lin. ft.	Comrs. Sewer Dist. No. 1.
La.	Montezuma	1:30 p.m., Jan. 22	Vit. clay tile sanitary sewer	R. A. Mortland, Town Clk.
Mass.	Boston	Jan. 23	Constructing a sewage pumping sta. and appurtenances	L. K. Rourke, Comr. P. Wks.
Ill.	Kankakee	9 a.m., Jan. 25	Constructing lateral sanitary sewer	D. Lavery, Pres. Bd. Loc. Impt.
Minn.	Wabasha	Jan. 27	Constructing sewerage system	J. M. Schouweiler, Vil. Rec.
Minn.	Bemidji	2 p.m., Jan. 27	Judicial ditch; total cost, \$11,741	J. L. George, Aud.
Ga.	Andersonville	10 a.m., Jan. 28	Sewer system and cesspool	Depot Q. M., Jeffersonville, Ind.
Ill.	Plano	2 p.m., Jan. 29	Constructing sewer, 67 manholes, 14 flush tanks, and 1 sewer tank	W. M. Foster, Clk. Bd. L. Imps.
La.	Grinnell	Jan. 30	12.5 miles of sewers; cost, \$75,000	T. L. Blank, San. Engr.
La.	New Orleans	Jan. 30	Drainage canal work	F. S. Shields, Sec. Sew. Bd.
Ont.	Simcoe	Feb. 1	Lateral sewers and house connections; cost, \$40,000	W. C. McCall, City Clk.
Ark.	Eureka Springs	Feb. 2	Constructing dam, settling basins and two filter units	A. C. Moore, Joplin, Mo.
Iowa	Alden	Feb. 2	Sewers, 11,635 ft; manholes, etc.	H. E. Button, City Clk.
Ill.	Kankakee	2 p.m., Feb. 3	Open ditch work	Comr. of Louis Drain. Dist. No. 1.
N. D.	Lakota	2 p.m., Feb. 3	County drain	J. Franzen, Sec.
Neb.	Scottsbluff	Feb. 3	8 to 10-in. pipe sewers and gravity sewage disposal plant, estimated cost, \$22,000	G. L. Shumway, City Clerk
La.	Clinton	Feb. 10	Sewers	City Clerk.
Wis.	Fond du Lac	Feb. 15	Vit. pipe sewer, 1½ miles, 8 to 18-inch	J. F. Hohensee, City Clk.
Mont.	Butte	5 p.m., Mar. 1	Sanitary sewer	W. A. Willis, City Clk.



## BIDS ASKED FOR

STATE	CITY	REC'D UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
<b>WATER SUPPLY</b>				
Kan., Douglas	Jan.	20.	Water works and filtration plant.....	State Bd. Health.
Fla., Ft. Myers	Jan.	20.	Improving water works.....	E. W. Sumner, City Clk.
Can., Toronto	noon, Jan.	20.	Filtration plant .....	H. C. Hocken, Mayor
Minn., Wabasha	Jan.	27.	Complete water works system.....	J. M. Schouweller, City Rec.
Mont., Columbus	Feb.	2.	Constructing water works .....	E. A. Westover, Town Clk.
Ky., Taylorsville	Feb.	7.	Water works system.....	J. H. Reid, Mayor.
<b>LIGHTING AND POWER</b>				
D. C., Washington	Jan.	19.	Electric conduit, wiring and interior lighting fixtures....	Supv. Arch.
W. Va., Charleston	3 p.m., Jan.	19.	Lighting streets, period 1 year.....	City Bd. of Affairs.
Iowa, Farmhamville	Jan.	19.	Furnishing material and constructing electric light and power systems .....	Town Council.
Pa., Philadelphia	3 p.m., Jan.	19.	Lighting fixtures, gas and combination, for school.....	A. F. Hammond, Supt. Supp.
N. Y., Niagara Falls	Jan.	20.	Lighting streets .....	City Clerk.
Ga., Atlanta	Jan.	20.	Lighting fixtures and lamps.....	Co. Comrs.
Mich., Wayne	Jan.	28.	Motors and electrical equipment for water works system..	Water Works Comr.
N. Y., Albany	Jan.	29.	Installing heating, ventilating and vacuum cleaning system .....	Com. on Pub. Bldgs., Co. Bd. Supvrs.
La., New Orleans	noon, Jan.	30.	Electrical machinery, drainage canal work.....	G. G. Earl, Gen. Supt.
Ill., Quincy	Feb.	2.	Lighting streets, from 1 to 3 years.....	City Clk.
N. Y., Albany	Feb.	4.	Electric wiring, conduits, fire alarm system, etc.....	Bd. Co. Supvrs.
<b>FIRE EQUIPMENT</b>				
N. J., Rumson	Jan.	26.	Two motor comb. chemical and hose wagons.....	City Clerk.
O., Youngstown	Noon, Jan.	27.	One com. engine and hose; one aerial ladder truck.....	Dir. Pub. Serv.
Can., Weyburn, Sask.	Jan.	29.	One comb. chemical and hose wagon, one ladder truck...	D. W. Gallagher, City Clk.
<b>BRIDGES</b>				
Minn., Luverne	1 p.m., Jan.	19.	Reinforced concrete bridge, span 20 ft.....	J. Kelly, Co. Aud.
Cal., San Diego	2 p.m., Jan.	19.	Constructing reinforced concrete bridge.....	Bd. Supvrs., San Diego Co.
Cal., Pasadena	Jan.	19.	Constructing a reinforced concrete bridge.....	Co. Bd. Supvs., Los Angeles.
Cal., San Jose	Jan.	19.	Erecting bridge .....	Bd. Supvrs., Santa Clara Co.
Md., Baltimore	Jan.	19.	One bridge .....	State Rd. Comm.
O., Cleveland	Jan.	21.	Bridge work .....	F. F. Goldenbogen, Clk.
O., Portsmouth	Jan.	22.	One bridge .....	Co. Comrs.
O., Van Wert	1 p.m., Jan.	23.	Constructing abutments .....	Bd. Comrs.
Neb., Osceola	4 p.m., Jan.	27.	Concrete bridges, culverts, etc., for 1914.....	R. E. Dearborn, Co. Hwy. Com.
O., Cleveland	11 a.m., Jan.	28.	Constructing concrete culvert .....	E. G. Krauser, Clk.
Ill., Chicago	Jan.	29.	Superstructure of bridge.....	Clk. Sanitary Dist.
Tex., Houston	Feb.	1.	Reinforced concrete bridge; cost, \$140,000.....	Ben. Campbell, Mayor.
Minn., Hastings	Feb.	3.	Erecting state bridge.....	Co. Aud.
<b>MISCELLANEOUS</b>				
Ill., Chicago	11 a.m., Jan.	19.	Two horizontal centrifugal pumps .....	L. E. McGann, Comr. P. Wks.
O., Bellaire	Jan.	19.	Post office .....	Supv. Arch., Wash., D. C.
Ga., Atlanta	11 a.m., Jan.	20.	Metal filing devices, furnishing court room equipment..	S. Smith, Ch. Com. Roads.
Mont., Great Falls	Jan.	20.	Steel reinforcement bars, 750,000 lbs.....	U. S. Reclamation Service.
D. C., Washington	2 p.m., Jan.	20.	Gasoline, panel body truck, 1,500 lbs.....	Ch. Clk., Dept. of Commerce.
Ill., Chicago	11 a.m., Jan.	20.	Cast iron water pipe, 6, 8, 12 and 16-inch.....	L. E. McGann, Comr. P. Wks.
Ill., Chicago	11 a.m., Jan.	20.	Special castings for cast iron water pipe for 1914.....	L. E. McGann, Comr. P. Wks.
R. I., Newport	10 a.m., Jan.	20.	A quantity of copper tubing and torpedo bronze.....	Navy Dept., Wash., D. C.
D. C., Washington	10.30 a.m., Jan.	20.	Steel cable, valves, brass pipe, steel pipe, etc.....	Maj. F. C. Boggs, Gen. Pur. Off., Isthmian Canal Comm.
N. Y., Brooklyn	10 a.m., Jan.	20.	Connecting rods, inner globes, rubber hose, electric air heaters, etc. ....	Navy Dept., Wash., D. C.
Mass., Boston	10 a.m., Jan.	20.	Lead and iron pipe .....	Navy Dept., Wash., D. C.
N. Y., Albany	Jan.	20.	Central energy clock system .....	Trus. Pub. Bldgs., Capitol
Pa., Philadelphia	noon, Jan.	20.	General repairs in police department.....	G. B. Porter, Dir. Dept. Pub. Safety.
Ill., Maywood	8 p.m., Jan.	22.	Motor driven air compressor, three centrifugal pumps, etc. ....	Village Board.
N. J., Jersey City	Jan.	22.	Furnishing and delivering valves.....	M. Fagen, City Clk.
Ill., Chicago	11 a.m., Jan.	22.	Corporation ferrules and brass plugs.....	L. E. McGann, Comr. P. Wks.
Cal., Hemet	2 p.m., Jan.	26.	Constructing corrugated iron culverts.....	C. M. Dietterich, City Clk.
Va., Bedford City	Jan.	26.	Post office .....	Supv. Arch., Wash., D. C.
Miss., Clarksdale	Jan.	27.	Construction Post Office and Court House.....	Supv. Arch., Treas. Dept., Wash., D. C.
N. Y., New York	Jan.	27.	Construction syphon .....	Bd. Water Sup., Munic. Bldg.
Wis., Madison	Jan.	27.	Foundation work for state capitol.....	L. F. Porter, Sec.
Col., Trinidad	Jan.	27.	Erecting county court house.....	G. F. Harlan, Ch. Co. Comrs.
D. C., Washington	10.30 a.m., Jan.	27.	Steel cylinders, shovels, creosote oil, etc.....	Maj. F. C. Boggs, Gen. Pur. Off., Isthmian Canal Comm.
Wash., Puget Sound	10 a.m., Jan.	27.	Cast iron pipes and specials.....	Bur. Sup. & Accounts, Navy Dept., Wash., D. C.
Ia., Muscatine	Jan.	28.	Constructing city hall, cost \$85,000.....	City Recorder.
Neb., Scottsbluff	Feb.	1.	Pipe and fire hydrants; cost, \$15,000.....	Vedov & Lillienstolpe, Engrs.
Mich., St. Joseph	7 p.m., Feb.	3.	Fire department building .....	L. Fillehr, City Clk.
Fla., Key West	7.30 p.m., Feb.	3.	30-ton incinerating plant.....	H. K. Cold, City Clk.
Can., Ottawa	4 p.m., Feb.	3.	About 85 miles welded steel pipe .....	City Clerk.
Pa., Reading	11 a.m., Feb.	4.	Garbage disposal, optional period.....	City Clerk.
Ill., Bloomington	noon, Feb.	10.	Furnishing and erecting 500 HP. water tube boiler.....	Supv. Arch., Wash., D. C.
Mo., Booneville	3 p.m., Feb.	11.	Post office .....	J. J. Quinn, City Controller.
D. C., Washington	Feb.	11.	Installing automatic weighing and recording scale.....	H. S. Hamlin, Asst. Sec., Treas. Dept.
La., New Orleans	Feb.	26.	Brick building for pumping station.....	Sewage & Water Board.
N. C., Raleigh	Mar.	2.	Erecting court house; cost, \$224,000.....	City Clerk.

## STREETS AND ROADS

**Anniston, Ala.**—Notable improvements having been made in highway leading into Anniston from every other direction, a considerable expenditure is now to be made on what is known as Rocky Hollow road, coming from east. Over \$600 has been appropriated for this purpose.

**Anniston, Ala.**—Six hundred dollars will be spent on Rocky Hollow road, according to agreement between commissioners court and citizens.

**Phoenix, Ariz.**—A detailed report has been submitted to advisory highway committee of Maricopa County by T. N. Clanton and O. S. Stapley, the sub-committee sent to California to study construction of concrete roads in that state. They recommend that main highways of Maricopa County be 15 feet wide, with a 3-foot dirt shoulder on each side, pavement to be a 4½-inch concrete base with a ½-inch asphaltum wearing surface. For feeders they recommend 10-foot roads of same material, with 5-foot dirt shoulders.

**Tucson, Ariz.**—On motion of Council-

man Sullinger, city engineer has been instructed to take steps for grading of two blocks south of 22d St. on Sixth Ave.

**Pomona, Cal.**—By April 1 of next year the \$150,000 worth of street improvement to be built under recent bond issue will be under way, according to statement made by Mayor Vandergrift and City Engineer Bayley. Announcement follows action of banks in taking up \$90,000 street and fire improvement bonds. Of this amount \$75,000 is for streets.

**Richmond, Cal.**—Council has adopted its resolution of intention to widen

Tenth St., from Barrett Ave to Richmond boulevard contract.

**San Francisco, Cal.**—Grading and paving of Salmon and Himmelmann Sts. have been petitioned for.

**San Francisco, Cal.**—Plans for widening completed portions of State highway to a minimum width of 21 feet have been presented to California Highway Commission by A. B. Fletcher, State Highway Engineer. This is to be attained by building gravel or broken stone shoulders 3 feet wide on each side of paved highway, thereby making improved roadway 6 feet wider.

**Tulare, Cal.**—City Trustees are considering the paving of various streets at estimated cost of \$30,000. E. Oakford is City Clerk.

**Bridgeport, Conn.**—Petitions have been received for various street improvements.

**Stamford, Conn.**—City Engineer is making maps and profiles of various streets which Common Council wants to pave or repair, if money for that purpose is granted by Board of Appropriation.

**Washington, D. C.**—Improvement of York St. is being discussed.

**St. Augustine, Fla.**—Committee composed of largest taxpayers of county is urging County Commissioners to construct permanent roads in county.

**Bloomington, Ill.**—City attorney has been instructed to prepare ordinance for paving of Olive St.

**Chicago, Ill.**—Proposition to build a private concrete toll road between Chicago and St. Louis is being discussed.

**Danville, Ill.**—Bonds for million and a half dollars for purpose of building hard roads throughout Vermillion County will be issued early in coming year if plans arranged by Vermillion County Hard Roads Club carry. Proposed scheme is to issue bonds and start work on roads at once. Bonds are to be retired as rapidly as state good roads fund is available.

**Springfield, Ill.**—Edwin H. White, superintendent of highways of Sangamon County, with engineers of State Highway Commission, have completed preliminary survey of Peoria Road in preparation for construction of hard road which will be extended north of river during coming summer. Preliminary surveys have already been made on South Sixth, Jacksonville, Washington and Beardstown roads which are included in list of hard roads which will radiate from Springfield. Mr. White will begin plans for new roads at once and bids for construction of roads will shortly be asked for.

**Fort Wayne, Ind.**—Gravel road bonds to total value of \$49,760 have been signed by Auditor Brown and delivered to Treasurer Bueter, to be sold on Jan. 12. There are twenty \$248 bonds for Webster Road in Monroe Township, total value being \$4,960. There are twenty \$688 bonds for Gilbert Road in Monroe Township, the total value being \$13,760. Twenty \$648 bonds for Collier Road in Monroe Township, total value being \$12,960. Twenty \$256 bonds for Grotrian Road in Madison Township to value of \$5,120. Twenty \$388 bonds for Munch Road in Madison Township to value of \$7,760. Twenty \$260 bonds for the Munch Road in Marion Township to value of \$5,200.

**Indianapolis, Ind.**—Mayor Bell recommends improvement of streets.

**Council Bluffs, Ia.**—City Engineer E. F. Stimson is to shortly start work measuring frontage of property along South ave. and Tostevin st. from end of paving on 16th ave. to junction of South ave. with 29th ave., in preparation for making estimate on probable cost to city of paving two street.

**Des Moines, Ia.**—Petitions asking resurfacing with asphalt of many business streets of East Des Moines are to be presented to City Council by East Side business men.

**Louisville, Ky.**—Ordinances have been adopted for various street improvements.

**Winchester, Ky.**—Extension of brick street system is recommended by Mayor Matlack, also building of more sidewalks.

**Annapolis, Md.**—At bid of 98.27 the firm of Alexander Brown & Sons was awarded entire issue of \$250,000 public highway bonds by Board of Public Works. Issue disposed of is known as Series "D" of Public Highway Loan, and bonds are issued in denominations of \$1,000 each, and bear interest at 4 per cent.

**Baltimore, Md.**—Callow ave. will be paved with a smooth, noiseless pavement, probably sheet asphalt.

**Baltimore, Md.**—After lengthy discussion, Board of Estimate has decided to

open 37th st., from Charles st. to University parkway, and create ornamental triangle of ground in front of Protestant Episcopal Cathedral and entrance to grounds of Johns Hopkins University at Homewood. Expense to city of making improvement is estimated at \$40,000.

**Haverhill, Mass.**—Mayor Moulton and Alderman Wood have been authorized to secure bids for crushed stone to be used by Highway Department this year, by order passed unanimously by Municipal Council.

**Mansfield, Mass.**—Board of Survey is considering petition for layout of Church Street extension and many other streets in residential section bounded by N. Main, Pratt, Park and Hope sts., proposed extension.

**Taunton, Mass.**—Mayor Fish recommends that Massachusetts Highway Commission be petitioned to continue State highway from Lakeville line to Elliott's corner on Middleboro ave.

**Duluth, Minn.**—Commissioner Roderick Murchison, head of works division, has plan for improving Superior St., between 15th and 25th Aves. West, by paving it with brick, using present macadam surfacing for base. By using macadam as base cost of concrete base would be eliminated, effecting considerable saving to property owners. Nothing definite was decided upon, but plan will be given serious consideration.

**St. Paul, Minn.**—Following is statement of street paving for 1914 as already ordered by Council. There are numerous other streets now under consideration, and no doubt many of them will go through. It is quite probable there will be at least one-half as much more ordered during coming season, such as Dale St., from Grand Ave. to Front St., and Selby Ave., from Victoria St. to Herschel Ave.: Holly St., 9,535 yds. with asphalt, bond issue \$13,825.75; Portland St., 9,898 yds. with asphalt, bond issue \$14,352.10; Market St., 4,155 yds. asphalt, bond issue \$6,200; Case St., 8,780 yds. asphalt and concrete, and 1,422 yds. brick, bond issue \$21,500; Snelling St., 20,000 yds. creosoted blocks, bond issue \$58,000; Hamline St., 1,416 yds. creosoted blocks, \$4,600; University St., 8,000 yds., 5.169 mileage, creosoted blocks, bond issue \$246,600; University St., 42,200 yds., 2.664 mileage, creosoted blocks, bond issue \$134,000; Hastings St., 7,197 yds. creosoted blocks, bond issue \$27,700; Prior St., 12,089 yds. creosoted blocks, bond issue \$42,600; Pine St., 980 yds. S. S., bond issue \$3,528; Summit St., 56,000 yds. creosoted blocks, bond issue \$174,000, and York St., 3,901 yds. brick, bond issue \$10,000. Total, 259,273 yds., 16.367 mileage, \$774,905.85 bond issues. City Engineer, Claussen.

**St. Paul, Minn.**—Resolutions have been adopted by the County Board instructing County Auditor George Ries to advertise for bids for construction and improvement of following roads next spring, at total estimated cost of \$51,500: Improving Arcade St., from the St. Paul, White Bear and Bald Eagle Road around the north end of Gervais Lake to Edgerton Road; estimated cost, \$10,000. Building road from the St. Paul, White Bear and Bald Eagle Road west to Arcade St. and north to Spoon Lake; estimated cost, \$5,000. Grade, clay and gravel Lake Johanna Road, from Lexington Ave. west to the east end of the 1913 improvement, and from Rice St. north and west one mile; estimated cost, \$7,000. Grade, clay and gravel Cleveland Ave., from the Minneapolis branch of the Northern Pacific tracks north to Bulwer Junction; estimated cost, \$8,500. Grade, clay and gravel the west town line road from the Long Lake Road east to New Brighton Road; estimated cost, \$3,000. Grade, clay and gravel Long Lake Road, from the north line of Section 19, west and north one-half mile; estimated cost, \$1,600. Resurface Rice St. with asphalt macadam, from the north end of the 1913 improvements, two miles; estimated cost, \$5,000. Surface and gravel the Washington County line road on the west line of Section 36, one mile; estimated cost, \$2,000. Grade, clay and gravel the White Bear and Lake Phelan Road south from the 1913 improvement to the city limits, one and one-tenth mile; estimated cost, \$3,600. Grade, clay and gravel Northwest Ave., from White Bear Beach to Bald Eagle Lake; estimated cost, \$2,700. Improve the Washington County line road from the north end of the 1912 improvement to Seventh St., in North St. Paul; estimated cost, \$2,700. Action on other proposed improvements was deferred until second meeting in January.

**Hannibal, Mo.**—A new highway, following water-line along Mississippi River, from Keokuk to St. Louis, through

Hannibal, is being projected by Commercial Club through its good roads committee.

**Palmyra, Mo.**—Palmyra is going to have one more fine road leading into town from rich and productive surrounding country, thereby increasing already large volume of business done in seat of Marion County. Some time ago, Allie Wilson, a Hannibal contractor, was awarded contract to build two miles of rock road between Palmyra and Philadelphia, 12 miles away. Six of the 12 miles are of gravel and make stretch of one of best roads in neighborhood. At joint meeting of County Court and the leading citizens of Philadelphia and Palmyra, it was decided to complete stretch of four miles lapsing between rock road already built and stretch of gravel highway. Cost will be \$4,000 per mile, of which farmers of neighborhood have agreed to contribute \$3,750, county furnishing the rest.

**Allenhurst, N. J.**—Bids will be received by C. B. Cade, Borough Clerk, until January 10, 1914, at 2 p. m., for purchase of \$5,000,000 street improvement bonds of borough of Allenhurst, N. J., dated Jan. 1, 1914.

**Binghamton, N. Y.**—Petition is being circulated for construction of pavement on Jarvis St.

**Jersey City, N. J.**—Board of Commissioners is considering the paving of section of West Side Ave. with granite blocks on concrete foundation. Charles A. Van Keuren is City Engr.

**West Long Branch, N. J.**—Mayor Golden has recommended following improvements: North Locust Ave. graded; Wall St. graveled three inches deep and 16 feet wide, with Allenwood gravel, from Elmwood to Norwood; Hulick Rd. graded and bridge widened full width and graded two or three feet; Whalepond Rd. plowed and shaped up and all roads kept scraped and cleaned; State Rd. side cleaning law enforced; sidewalks cut to grade wherever the road grade has been established and curbs and walks encouraged wherever practical.

**Auburn, N. Y.**—Provision for referendum vote on project of building \$300,000 system of county highway has been made by Board of Supervisors. Board has requested assemblyman and senator from this district to have enabling act introduced in State Legislature in order that matter might be voted on in April.

**Buffalo, N. Y.**—City expects to use creosoted wood block on some bridge and viaduct work this year, probably to extent of 1,800 yds.

**Fulton, N. Y.**—City Chamberlain Fred A. Summerville will receive bids for \$50,866.23 issue of bonds to pay for paving W. Broadway and W. First st. at City Hall Jan. 15, when successful bidder will be awarded issue by Common Council.

**Hempstead, L. I., N. Y.**—Improvement of Woodfield road has been authorized.

**Lestershire, N. Y.**—Taxpayers will vote at special election Jan. 31 of bond issue for paving.

**Newburgh, N. Y.**—Mayor Corwin in his annual message recommends adoption of definite plan of street improvement.

**Oneida, N. Y.**—Board of Supervisors of Madison County are in favor of constructing highway from Oneida to Munnsville, to cost about \$32,460.

**Durham, N. C.**—After a great deal of contention, especially by people from northern section of county, Board of Commissioners have adopted old route for extension of Guess Road. Board ordered this road extended to Orange County line, and when this order was published people of that section drew up petitions asking that old route of road be adopted. Another section of county asked that new route be selected for extension.

**Elizabeth, N. C.**—Citizens are asking for improvement of system of building public roads in county.

**Louisburg, N. C.**—With only four votes cast against proposition, voters of Louisburg Township have already assured issuance of \$40,000 in bonds for road improvement.

**Canal Dover, O.**—Plans for extensive system of paved streets in Canal Dover have been accepted by City Council. Plans for paving on five important streets, embracing nearly two miles of paving, and which cost over \$70,000 for curbing, grading and paving, have been submitted to City Engineer Arnold and approved.

**Dayton, O.**—Election on issuance of \$250,000 road bonds will be held up pending Supreme Court's action on validity of election law.

**Youngstown, O.**—Resolutions have been adopted to pave Hallech st. from Logan ave. and to pave Foster st. from Rayen ave. to Belmont ave.



**Youngstown, O.**—Legislation has been authorized to sidewalk Clifton st. and to pave and sewer Himrod ave. to intersection of Oak st. from present end of the paving.

**Youngstown, O.**—Ordinance has been passed providing for paving of Halls Heights Ave.

**Youngstown, O.**—Resolutions have been adopted for paving of Himrod Ave., Halleck St. and Foster St.

**Bay City, Ore.**—Bay City has issued \$15,000 for street improvements.

**Butler, Pa.**—County Commissioners and Good Roads Committee of Chamber of Commerce have decided to pave Saxenburg road from end of Butler boro line at Center ave. to Allegheny County line, via Jefferson Center, and thence to connect up with paved highway at Culmerline.

**Lebanon, Pa.**—City Council has passed resolution authorizing and directing Supt. of Streets and Public Improvements, Solicitor and Engineer to prepare plans for about 16 blocks of paving in business district. G. F. Krause is Supt.

**Lebanon, Pa.**—Ordinance No. 29, providing for grading and macadamizing of unopened streets and unimproved streets on per foot system has been introduced and passed first reading.

**Philadelphia, Pa.**—Authorization of municipal loan of probably \$10,000,000 for public improvements by Councils at next or subsequent meeting of bodies and submission of proposed loan to vote of people at special election to be held in March is part of program under consideration by Councils' Finance Committee. Included in suggested improvements which Senator McNichol would provide out of \$10,000,000 loan is complete system of belgian block and wood block street pavements between Callowhill and South sts. and the two rivers.

**Williamsport, Pa.**—Mayor Stabler has recommended paving of following streets: Packer St., from Market St. to Brandon Park; Fourth St., from the Junction to Cemetery St.; Cemetery St., from Fourth St. to the N. C. R. R.; Erie Ave., from Cemetery St. to Lycoming Creek; Mulberry St., from East Fourth to P. & E. R. R., and resurfacing of West Third St. from West to Locust St.

**Wilkes-Barre, Pa.**—Plans have been revised by E. K. Finch, Engr., for paving Sherman St., from Northampton St. to South St., and bids will soon be asked.

**York, Pa.**—Mayor Labeau recommends providing funds for paving of street intersections and in front of non-assessable property, in order that universal street paving operations can be inaugurated.

**Pawtucket, R. I.**—Resolution has been adopted appropriating \$14,350 for purchase of land for widening of Dexter St.

**Aiken, S. C.**—County Commissioners have made big step forward in building of good roads for this county, when they decided to accept government's offer of \$10,000 for building of good road in this county. Proposed road will begin at Edgefield line and come to Aiken, and from Aiken to Barnwell line, thus giving Aiken County 28 miles of best roadway in state, and at same time serving large number of people.

**Sioux Falls, S. D.**—Specifications for paving of Duluth Ave., from Third to 18th St., have been adopted.

**Bristol, Tenn.**—People of Johnson County, Tenn., are organizing, with view to building their section of "Crest of Blue Ridge Highway," which is to be brought this way from Carolina Mountains. Sullivan County, Tenn., has already graded most of its portion of road, and has only to cut grade wider and place macadam on 8 miles before its work is completed. Citizens of Boone and Watauga County, North Carolina, are being urged to provide for their link of the highway.

**Bristol, Tenn.**—Court has named committee to investigate road-building status with view to recommending to court whether or not additional bond issue would be advisable. County has legislative authority to issue \$100,000 more in bonds, which would make total \$600,000. Court is not disposed to consider voting upon another bond issue until all money realized on last issue of \$200,000 has been expended, and this will not be before late in the spring.

**Chattanooga, Tenn.**—Hamilton County Road Commission will ask for appropriation of either \$5,000 or \$8,000 to enable them to build Main ave. in North Chattanooga. Some time ago county sold bonds to amount of \$25,000 to build permanent street on Main ave. from Frazier ave. to Mississippi ave. Bids were taken and it was found that it will take \$30,000 to build asphalt mac-

adam road by penetration system and \$33,000 by mixing method.

**Gainesboro, Tenn.**—Bonds in sum of \$100,000 which were voted for good roads on December 6, will be sold within the next few months.

**Johnson City, Tenn.**—At quarterly session of Washington County Court in Jonesboro, election will be called, allowing people of county to vote on proposed \$415,000 road bond issue.

**Knoxville, Tenn.**—Bond election has been ordered in Morgan County for March 28, when voters will pass on question of issuing \$300,000 of bonds to build pike roads. This county now has no pikes.

**Nashville, Tenn.**—Appropriation of \$3-000 has been authorized for improving of Ligon ave.

**Ballinger, Tex.**—An effort will be made by County Judge M. Kleberg, at next term of Commissioner's Court, to improve conditions of roads over Runnels County.

**Bonham, Tex.**—Citizens of good roads precinct No. 1 will on Jan. 29 determine issuance of road bonds to amount of \$300,000.

**Corpus Christi, Tex.**—Council has decided to pave Waco st. and S. Caranchua st.

**Corpus Christi, Tex.**—Election will be held Jan. 17 for voting on \$250,000 bond issue for Robstown Good Roads.

**Dallas, Tex.**—Instructions have been given by Board of Commissioners to City Attorney O'Donnell to begin necessary process for opening of Preston St., from Pacific to Live Oak and for opening of Sherman from Williams to Commerce.

**El Paso, Tex.**—Council may appropriate \$10,000 for work on Scenic highway.

**Galveston, Tex.**—Commissioner Deats of road and bridge committee of Board of Commissioners of Galveston County, has submitted his recommendation with regard to additional roads to be constructed in county from proceeds of sale of \$250,000 bonds authorized by vote last September. Report read as follows: "The Hitchcock-Lamarque Road, passing by cemetery at Hitchcock and through Brewster property. The Dickinson-San Leon Road. The League City-Kemah Road, using present route. The League City-Freindwood and a road along the Southern Pacific Railroad connecting Kemah Road with San Leon Road. That all grade work be done by county's force and that wooden pile bridges over Highland bayou, Snowball's gully and Chigger creek be also built by county's forces; that all other bridges and culverts be reinforced concrete with the exception of a few pipe culverts. That on all the above roads that mudshell be 12 feet wide, 6 inches deep on the edges and 8 inches deep in center."

**Georgetown, Tex.**—A meeting has been held for purpose of asking bond issue of \$120,000 to build additional good roads. Proposition is to submit question to people of Round Rock and Hutto as to entire Commissioners' Precinct No. 1 and ask their aid, and if not available question will be taken up for Justice Precinct No. 2. Opinion was largely in favor of first proposition, and if not desired for smaller area. There are nearly 75 miles of macadam road in precinct at present.

**Orange, Tex.**—Road bonds to amount of \$200,000 were voted in Orange County some time ago for system of highways.

**San Antonio, Tex.**—In meantime Council is ready to spend the \$285,000 now available for street widening and opening. It is intention to appropriate this money as rapidly as possible and to make it go as far as possible. From money now available administration will endeavor to give first assistance to four projects believed to be of most importance, to wit: Widening of South Alamo St.; opening of St. Mary's St., north and south; widening of Soledad St., from Houston to Commerce St., and widening of North Flores St.

**Temple, Tex.**—Anticipating bond issue for \$600,000 with which to build good roads in Bell County Road District No. 5, which includes City of Temple and much surrounding territory, will carry in special election to be held Jan. 15, Bell County Commissioners' Court has published request to all voters residing in proposed road district outside corporate limits of Temple to meet on Jan. 20 for purpose of electing members of general committee which will designate particular roads to be constructed and quality of materials to be used, acting as advisory body to Commissioners' Court.

**Waco, Tex.**—County Commissioners will be petitioned to submit bond issue

of \$800,000 to voters of justice precinct No. 1, McLennan County, for improvement of roads. The precinct includes city of Waco and south extending several miles on both sides of the river to the county line. Taxable values amount to \$35,000,000. Estimates include 119 miles of road to be graded and paved principally with oil-bound macadam.

**Pocatello, Utah.**—Theodore Turner, Mayor of Pocatello and chairman of State Highway Commission, will leave shortly for Washington for purpose of inducing Interior Department to urge appropriation of \$100,000 to be applied to that portion of north and south state highways in Adams and Idaho Counties. Senator Macbeth has appeared before board and urged that roads be built into interior instead of in open country and asked for road into Stanley Basin from Boise, also for roads through Custer and Lemhi Counties. It was proposed to consider road matters on following schedule of importance: 1. New Meadows to Grangeville. 2. Old's Ferry to the eastern boundary of the state in Bear Lake County. 3. St. Regis Pass to Spokane Bridge, in North Idaho. 4. Idaho Falls-Yellowstone Park highway. 5. Salmon City and Gibbonsville to southern connections. 6. Idaho-Montana highway north from Idaho Falls and connections. This is practically connecting system of state highway project that will place 23 county seats in the state in direct connection with state capital.

**Bristol, Va.**—Resolution has been adopted asking special law to extend Euclid ave. to West Bristol.

**Portsmouth, Va.**—People of Princess Anne are now preparing to ask Legislature at its coming session for authority to issue something like \$100,000 or \$150,000 for road improvements within borders of Princess Anne. The bond issue will be for general betterments. For every dollar county of Princess Anne spends State of Virginia will spend similar amount on roads in that county. Bond issue of \$150,000 would mean that Princess Anne will in next few years have \$300,000 spent on her roads.

**Appleton, Wis.**—Movement will be started looking toward building of concrete highway the full seventy miles from Fond du Lac to Green Bay through Oshkosh, Neenah, Menasha, Appleton, Kaukauna, Wrightstown, Little Rapids, Depere.

**Madison, Wis.**—Wisconsin will build 1,650 miles of state roads in 1914, expending \$4,000,000 upon them. Prospective system of state highways is designed to include 15 per cent. of highways in each county, particularly those connecting markets, town and county seats.

#### CONTRACTS AWARDED.

**Imperial, Cal.**—To O. & C. Construction Co., of Fullerton, Cal., at \$176,919, for improvement of streets, including curb, walks, culverts and paving.

**Hartford, Conn.**—To Porcero Construction Co., Willimantic, Conn., at about \$1,889, for about 1,230 ft. of gravel road on Plainfield-Jewett City road, town of Plainfield, and to Amos D. Bridges Sons, Inc., Hazardville, Conn., at about \$7,770, for about 4,350 ft. of trap rock macadam road on Hartford-Norwich turnpike, town of Glastonbury.

**Fort Wayne, Ind.**—Board of Works has let formal contracts for eight street pavements and one alley pavement on orders entered Dec. 30. The Moellering Construction Co. bid \$8.06 a linear foot for paving Sherman from High to Archer for brick, and Grace \$7.73 a foot for asphalt, and \$7.51 for anchored bituminous concrete. Preliminary order was entered for concrete. The Grace company bid \$4.95 for resurfacing Berry St. This was only bid.

**Hartford City, Ind.**—Contracts for Stotlar No. 2 and Whetsel roads, both in Jackson Township, have been awarded to P. W. Clamme by Board of Commissioners. Bids were as follows: Stotlar Road—Clamme, \$11,113; C. F. Culberson, \$11,744; H. B. Swoveland, \$11,867. Whetsel Road—Clamme, \$11,424; C. F. Kegerreis, \$12,306; Joseph Dailey, \$11,835.

**Portland, Ind.**—Following bids have been submitted to the Commissioners for construction of one mile of gravel road on township line between Madison and Noble Townships. Ford, Lotz & Wells, \$3,300.75; D. O. Teeters, \$3,970; Luttman & Fennig, \$4,493; H. D. Shaffer, \$3,643; Floyd A. Freemyer, \$3,947, and Lowery & Mannix, \$3,947. Ford, Lotz & Wells were lowest bidders and they were

awarded contract for construction of road at their bid of \$3,300.75.

**Portland, Ind.**—Bids have been received for construction of three miles of gravel road in Green Township petitioned for. Large number of bids were presented and contract was awarded to James M. Wright at his bid of \$10,300. Following bids were presented to board: Harvey Manning, \$11,873; D. O. Teeters, \$12,937; Lutman & Fennig, \$11,861; Orpha Lee and Otto Van Matre, \$11,939.50; James M. Wright, \$10,300; Mike Ankrom and N. E. Griffith, \$14,350; William Long and F. Wall, \$13,127; Swihler and Mills, \$12,500, and Shultz, Robinson, Shultz & Hock, \$11,930. Contract for improvement was contracted for at about \$6,500 below the estimate filed by the County Engineer. Charles Myers was appointed superintendent of construction by Commissioners and contractor was given until first day of Jan., 1915, in which to complete the road.

**Portland, Ind.**—For construction of road in Jackson Township, by County Commissioners to Charles H. Ireland, of Bryant.

**Lake Charles, La.**—By City, to Ritchie Bros., Topeka, and Wichita, Kan., to construct brick paving and asphalt filler, amount of work involved \$170,000.

**St. Mary's City, Md.**—To McDonald Construction Co., of Mt. Vernon, N. Y., at \$37,361, to grade 5.38 miles road between St. Mary's City and Leonardtown.

**Southbridge, Mass.**—For paving with wood blocks on Main st. to Adams & Ruxton Constr. Co., of Springfield, at about \$23,000.

**Grand Rapids, Minn.**—To J. M. Dowling, of Duluth, Minn., at \$5,000, for construction of three miles of Blackberry-Warba road by County Commissioners.

**Independence, Mo.**—To Davidson Construction Co., Kansas City, at \$81,180, to macadamize Blue Ridge Blvd.

**St. Joseph, Mo.**—By city, to Interstate Paving Co., to lay cement sidewalks on St. Joseph Ave., Albemarle St. to Highland Ave., and 6th St., Remick to Atchison St.

**Omaha, Neb.**—Contracts for street grading have been awarded as follows: Arbor St., from 24th St. to 26th St., to J. E. Turner, at 0.225; 34th St., from California St. to Webster St., to Gust. Hamel, at 0.28, and 43d Ave., from Dodge St. to Davenport St., to J. E. Turner, at 0.34.

**Buffalo, N. Y.**—By Park Comrs. for paving with brick Niagara Falls blvd., 40 ft. wide, from Main st., to Constantine Constr. Co., at \$10,000.

**St. George (S. I.), N. Y.**—To Richard Lamb, contract for paving with wood block on present concrete foundation, roadway of Richmond Terrace, New Brighton, from York Ave. to Sailors' Snug Harbor. His bid was \$25,032. The other bidders were: Republic Construction Co., \$38,930.50; U. S. Wood Preservation Co., \$31,675.80; the Topeka Co., \$40,138.10, and the Barber Asphalt Paving Co., \$41,267.75. And to John E. Donovan of West New Brighton, contract for repaving with napped granite blocks the roadway of Richmond Turnpike, at Tompkinsville, from Tompkins Ave. to Brook St. His bid was \$27,895.10. Other bidders were: Joseph Johnson's Sons, \$28,982.30; Cornelius Vanderbilt, \$26,219.20, and the Topeka Co., \$31,534.60.

**Tonawanda, N. Y.**—For paving Clinton St., to Lawrence Schultz, Fredonia, N. Y., at \$40,000.

**Hendersonville, N. C.**—City Commissioners have let contract for paving of Fifth Ave. to Atlantic Bitulithic Co., of Richmond, Va. This avenue, leading residential street of the city, will be paved from Main St. to city limits, distance of about one mile, and work will begin at early date.

**Cincinnati, O.**—To M. F. Quill, at \$75,000, for paving of Eastern ave. with granite blocks from Delta ave. to old corporation line at Linwood.

**Pittsburgh, Pa.**—To Chas. Verr, 227 Grand ave., Bellevue, at \$5,447, for filling and paving approaches to Bridge No. 1, Dry Run, Jefferson Township, and Clairton Boro. line.

**Belton, Tex.**—By City Council, contract for 1,700 sq. yds. of paving and 700 lin. yds. of curbing in Belton, to Texas Granitoid Co., of San Antonio, at \$2.24 per sq. yd., curbing being included as part of paving.

**Olympia, Wash.**—To Neahe Construction Co., Waterville, Wash., at \$19,558, for construction of section of Sunset highway in Douglas County, by State Highway Commission.

**Olympia, Wash.**—State Highway Commission has let contract to Quigg Construction Company for building of four miles of Pacific highway on waterfront route for \$51,732. Road to be built is

across county line, between Whatcom and Skagit Counties, with most of it in Whatcom.

**Seattle, Wash.**—By Board of Public Works, for grading of Ellis Ave., to S. Noemile, at \$28,046.75.

## SEWERAGE

**Alhambra, Cal.**—Bonds in sum of \$250,000 for sewerage system have been defeated. Proposition will probably be taken up again within a year. O. M. Caulk is City Clerk.

**Stockton, Cal.**—Following bids for construction of sewers in Yosemite Terrace have been read and taken under advisement: Patrick F. Murphy, \$3,465; Frank C. McIntire, \$3,450; A. B. Munson & Son, \$3,575.

**Bridgeport, Conn.**—City is discussing plans for expenditure of \$80,000 for extension and improvement of sewer system. Alfred T. Terry is City Engr.

**Waterbury, Conn.**—Extension of sewer system is recommended by Mayor.

**Daytona, Fla.**—City will vote Feb. 11 on \$75,000 bonds to construct sewer and drainage system.

**Tampa, Fla.**—At meeting of Board of Public Works, Engineer Alexander Twombly, of New York city, who has in hand big task of laying out city's new septic tank sewerage system, will submit his plans and specifications, cutting off enough of laterals in thinly settled outlying sections of city to bring cost of big project within \$500,000 which city has for the work. In making over his plans Mr. Twombly has cut down none of main sewers, but simply eliminated laterals where they could be spared at this time.

**Farmer City, Ill.**—Engr. Webb Lemon is preparing plans for construction of new sewer system in eastern section of town. Estimated cost, \$26,848.

**Rockford, Ill.**—Board of Local Improvements is discussing installation of two-mile trunk line sewer system in southeastern section of city, to cost about \$119,808.

**Indianapolis, Ind.**—Question of sewage disposal is being discussed.

**Atchison, Kan.**—Following bids were received for Sewer No. 7: J. W. Kelso, \$4,717.30; E. W. Geiger Const. Co., \$4,778.70; O'Neil Const. Co., \$5,314.05. Owing to blunder in Kelso low bid, Council rejected all bids and ordered clerk to readvertise.

**Ottawa, Kan.**—City Attorney has been instructed to prepare ordinances providing for sewer lateral No. 60 between Powhatan and Black Hawk and from Cedar to Oak st.; for sewer lateral No. 61 on W. Fifth and Ash to Beech st.; for sewer lateral No. 62 on W. Sixth from Ash to Beech, and for sewer main on west side of Ash from Fourth to Sixth sts.

**Winchester, Ky.**—Extension of sewer system is recommended by Mayor Matlack.

**Baltimore, Md.**—During early part of present year it is expected that unspent portion of \$200,000,000 sewerage fund will be put under contract.

**Haverhill, Mass.**—Petition has been filed asking for better sewerage system along Kenzoa ave. and its adjacent streets.

**Taunton, Mass.**—An order appropriating by bond issue, \$15,000 for sewer construction during 1914, has been referred to committee on finance.

**Worcester, Mass.**—City Council is considering expenditure of \$40,000 for extension of outfall sewer system. Matthew Gault is Supt. of Sewers.

**St. Paul, Minn.**—City Engineer Clausen's estimate of cost of proposed Woodlawn-Fairmount sewer system fell considerably short of lowest bid submitted by John Lind, at \$86,000. To this must be added cost of inspection, about \$2,000. Engineer's estimate was \$75,500. Board of Public Works will refer matter to Council at its next meeting.

**Sedalia, Mo.**—Plans and specifications are being prepared for complete sewerage disposal works, for southwest Sedalia. Burns & McDonnell, Kansas City, Mo., are Const. Engrs.

**Springfield, Mo.**—Plans are being prepared and bids will shortly be asked to construct district sewer with three or more miles of mains in Fifth Ward; estimated cost, \$24,000. C. E. Phillips is City Engr.

**Fort Benton, Mont.**—Plans and specifications as prepared by Burns & McDonnell for sewers were recently approved and arrangements are being made for proceeding with construction work in the early spring.

**Three Forks, Mont.**—Firm of civil engineers has devised system of sewerage for Three Forks whereby they believe pumping of sewage at outlet, a problem City Council has been wrestling with for some time, can be done away with during the greater portion of year. Council has been gathering data on cost of water works and sewerage systems for some months with expectation of putting propositions up to vote of citizens in near future.

**Avalon, N. J.**—Avalon Council has issued \$20,000 worth of bonds for extension of sewerage and water systems.

**Camden, N. J.**—City has ordered construction of sewer or drain in and along Jackson st. A. L. Sayers is Street Comr.

**Newark, N. J.**—Nine bidders competed for contract to construct Section 12 of Passaic Valley trunk sewer when proposals were opened by Passaic Valley Sewerage Commission. The Oscar Daniels Co., of New York, with a bid of \$277,550, was low, but, as usual, award was deferred for week by Commission. Highest bidder was William J. McCloud & Co., of Elizabeth, who wanted to do job for \$542,400. Other bidders and their figures were: Culp Co., Inc., of Brooklyn, \$504,700; the Kingsbridge Contracting Co., Inc., of New York, \$441,900; the Keystone State Construction Co., of Philadelphia, \$390,900; Bruno & Pettiti, of Belleville, \$356,500; Patrick McMeel, Brooklyn, \$319,900; Fusco Construction Co., of this city, \$318,500; Whiting-Turner Construction Co., Baltimore, \$301,790. Section for which bids were submitted is located in Acquackanonk Township, and extends from Third Ave. to Passaic city line.

**Trenton, N. J.**—John H. Gregory, Consult. Engr., of Hering & Gregory, 170 Broadway, New York, has recommended erection of incinerator and power plant for disposing of garbage and generating power for sewage pumping plant. Estimated cost \$195,500, with annual cost of operation of \$28,340.

**Wapplingers Falls, N. Y.**—Sewer system will be installed this year.

**Washington, N. C.**—Gilbert C. White, engineer, Charlotte, N. C., is preparing plans for sewer, electric plant and water works improvements. Cost, \$160,000. Bids will shortly be advertised.

**Bowling Green, O.**—Wood County is discussing building large sewage disposal plant into which trunk lines will convey sewage from north, east, south and west.

**Sandusky, O.**—City Council is considering site for erection of sewage disposal plant.

**Youngstown, O.**—Request from County Commissioners for permission to connect Pleasant Grove sewer system to proposed new city district sewer at township line, commissioners to pay \$6,000 toward cost of sewer, has been referred to City Engineer and City Solicitor.

**Williamsport, Pa.**—Mayor Stablis has recommended that following storm sewers be constructed this year, if sufficient funds should be available: A main sewer on Clark St., commencing on east side of Park St., running east to Maynard St., then south on Maynard St. to Maynard Alley, thence on Maynard Alley to the conduit on Locust St. A lateral sewer on Maynard St. from 4th St. south, connecting with the last mentioned sewer at Maynard Alley. A storm sewer should also be constructed on Washington St. from McClure Run west to Railway St.

**Latta, S. C.**—City will shortly construct sewer system at cost \$20,000; 4½ miles 8 to 15-in. sewer; septic tank. Engineer is J. B. McCrary Co., Atlanta, Ga.

**Sioux Falls, S. D.**—Resolution has been adopted for connecting sewers from lateral sanitary sewers in various streets. G. W. Burnside is Mayor. W. C. Leyse is City Auditor.

**El Paso, Tex.**—Election will be held Feb. 11 for voting on \$250,000 bond issue for sewers and waterworks.

**Temple, Tex.**—City officials have received information from Austin that issue of \$75,000 sewer purchase and extension bonds voted by this city some months ago have finally been approved by Attorney General's Department at State Capital. About \$45,000 of amount will be paid over to Temple Sanitary Sewer Co. for purchase of its plant and remaining \$35,000 will be expended in extensions and improvements of the system as soon as it comes under city ownership, which will occur within next 30 days.



**East Bank, W. Va.**—A \$6,000 bond issue has been voted by citizens of East Bank, Kanawha County, for sewerage and water works.

**Watertown, Wis.**—Mayor Breen recommends construction of adequate sewers when property is seriously flooded.

#### CONTRACTS AWARDED.

**Richmond, Cal.**—Bids have been opened for construction of lateral sewers in number of streets in extreme east portion of city, including Soit, Maine, Wendell, Castro and portion of 23d St. Bids were submitted by Chambers & Heafey, \$8,098.41; T. Clinch, \$8,229.45; William Heafey, \$7,641.82; Fred Meyers, \$9,100.39; Gigax & Blalock, \$8,575.23; L. L. Page, \$7,743.46, and G. W. Cushing, \$8,384.75. Bids were read by the clerk and referred to city attorney and city engineer for investigation. Officials reported later that William Heafey was lowest bidder and Council so awarded the contract.

**Santa Barbara, Cal.**—To Modern Construction Co., Los Angeles, at about \$16,500, for construction of 6,500 ft. of sewer.

**Greenwich, Conn.**—By Sewer Commissioners for sewer construction to Antonio Conti & Co., 60 Temple St., Hartford, for Lake Ave. section at \$11,000; to Daly & Merritt, Port Chester, N. Y., for Meadowbrook section at \$22,000.

**Hammond, Ind.**—To United Contr. Co. of Hammond, by Bd. Pub. Wks., for construction of deep main sewer system and pumping station with settling tanks. Work includes 975 lin. ft. of 108-in. 3-ring brick sewer, 2,900 lin. ft. of 96-in. 3-ring, 1,215 lin. ft. of 84-in. 3-ring, 2,392 lin. ft. of 81-in. 3-ring, 1,322 lin. ft. of 78-in. 3-ring, 1,995 lin. ft. of 66-in. 3-ring, 5,415 lin. ft. of 60-in. 2-ring, 1,640 lin. ft. of 54-in. 2-ring, 2,671 lin. ft. of 48-in. 2-ring, 2,605 lin. ft. of 42-in. 2-ring, 2,099 lin. ft. of 36-in. 2-ring, 1,710 lin. ft. of 30-in. 2-ring, 158 new manholes with iron covers, 110 new catch basins with iron covers connected with 9-in. pipe half trap, 24,800 ft. 6-in. house drains, and constructing a pumping station building, smoke stacks with machinery and equipment, settling tanks, sludge bed and drains, outlet sewers and connections, 36-in. force main, sidewalks, curbing, roadway and water supply. Estimated cost, \$895,000. Other bidders: Thos. Laverne, Hammond, \$886,786 and Illinois Improv. & Ballast Co., Chicago, Ill., \$953,023.

**Concordia, Kan.**—For constructing sanitary sewers in Dist. 2, to McGuire & Stanton, at \$16,682. Other bidders: W. B. Stingley & Co., \$18,819; Everett & Burt, \$18,325; McCoy & Taylor, \$16,595, and E. M. Eby, \$17,352. E. E. Hopper is Consulting Engr., Kansas City, Mo.

**Baltimore, Md.**—To Carozza Bros. & Co., \$80,552, for construction of additional section of sanitary sewerage system.

**Boston, Mass.**—For construction of Section 69 of new Mystic Sewer, North Metropolitan System, Winchester, to Henry Spinach Contracting Co., Waterbury, Conn., at \$33,360.

**Hibbing, Minn.**—Bid of Remington Lumber Co. for sewer pipe to be used in Brooklyn system was lowest received and contract for carload was awarded to them.

**Springfield, Mo.**—To F. W. Johnson, city, at about \$11,000, for construction of two miles of 8 and 10-in. vitrified pipe sewer in District No. 4, Section No. 5.

**St. Joseph, Mo.**—By Board of Public Works, following contracts: To Skilled Construction Co., 1110 Olive St., to construct sewers in District No. 39, consisting of 468 ft. pipe and 4 manhole castings; James Marnell, 1010 Ridenbaugh St., District No. 138, 4080 ft. pipe and 12 manhole castings, and to E. F. Mignery, 1108 Bellevue Ave., District No. 127, 2205 ft. pipe and 22 manhole castings. Chas. W. Campbell is City Engineer.

**Buffalo, N. Y.**—To Frontier Contr. Co., for constructing a 5-ft. 6-in. x 9-ft. brick and stone sewer in Lang Ave., between Bailey Ave. and Texas St., at \$12,890.

**Cincinnati, O.**—For Avondale relief sewers, Contract 1, to Thos. Maloney, of Cincinnati, at total estimated cost of \$21,425, including inspection and advertising; type of construction selected, reinforced concrete pipe. Totals of other bids received: (a) reinforced concrete pipe and vitr. pipe; (b) brick and vitr. pipe; (c) concrete and vitr. pipe; Thos. Maloney (b), \$22,008, (c) \$22,980; John B. McLane & Co., Newport, Ky. (a), \$24,-

710, (b) \$23,116, (c) \$29,803; Thos. P. Starck, Cincinnati (a), \$29,815, (b) \$28,542, (c) \$36,501; The Connelly Constr. Co., Cincinnati (a), \$30,764, (b) \$28,325, (c) \$30,288; Cannell Ames Constr. Co., Columbus, (a, b and c each), \$41,488.

**Portland, Ore.**—To Dennis & Christensen, at \$1,141, for constructing Union Ave. sewer from E. Salem to Hawthorne sts., and to J. P. O'Neill, at \$1,251, for constructing Leo Ave. sewer from Milwaukee to E. 15th sts.

**Martin, Tenn.**—By city, to Bell-Hudson Construction Co., Poplar Bluff, Mo., to construct sanitary sewer system.

**Austin, Tex.**—By city, to Johnson & Carr, at \$2,659.45, to construct sewer on East Ave., from 10th and Sabine Sts. to 19th St. and East Ave.

**Seattle, Wash.**—By Board of Public Works, for construction of sewers on Dayton Ave., to Syllaasen, Sando & Peterson, at \$71,317.20.

#### WATER SUPPLY

**Glendora, Cal.**—Bonds in sum of \$25,000 have been voted for construction of water works system.

**Bristol, Conn.**—City will shortly sell issue of \$500,000 water bonds.

**Washington, D. C.**—Extension of city's water mains to Deanwood, primarily for purpose of affording fire protection service for that community, is being urged.

**Jacksonville, Fla.**—Sargent Hamilton, Jacksonville, has prepared plans for pumping station, ultimate capacity of water works 60,000,000 gals. daily; 12,000,000 unit being installed; cost, \$35,000. E. L. Carroll is Supt.

**Pooler, Ga.**—Town will expend \$6,000 to construct water works.

**Streator, Ill.**—Proposition to bond city for construction of water system in village of Grand Ridge has been voted favorably on. Plans adopted call for sinking of deep well on ground on which old power house stood. Here will be found an abundant water supply, and pumps and pressure system is guarantee of sufficient supply at all times.

**Edinburgh, Ind.**—Bond issue of \$6,000 has been voted for improvements to water works system.

**Mishawaka, Ind.**—According to resolution passed by Board of Public Works at its final session superintendent of water works was directed to install meters as soon as possible on all leads from city water mains for private fire lines or for manufacturing purposes; also to install them on all service or private fire lines to school buildings which are now unmetered.

**Mt. Pleasant, Ia.**—Plans and specifications are being prepared for new reservoir, pumping machinery and improvements to water works plant at Mt. Pleasant, Ia. Burns & McDonnell, Kansas City, Mo., are Const. Engrs.

**Arkansas City, Kan.**—Plans and specifications are being prepared for water works improvements, pumping machinery and equipment and extension of mains for Arkansas City, Ark. Approximate cost of improvements, \$75,000. Burns & McDonnell, Kansas City, Mo., are Consulting Engrs.

**Westmoreland, Kan.**—Installation of municipal waterworks system has been ordered.

**Winchester, Ky.**—Extension of water mains to river is recommended by Mayor Matlack.

**Pittsfield, Mass.**—Water committee recommends installation of meters.

**Avalon, N. J.**—Avalon Council has issued \$20,000 worth of bonds for extension of water and sewerage systems.

**Keyport, N. J.**—Improvement of water system is recommended by Mayor Walling.

**Spotswood, N. J.**—Mayor Arthur B. Appleby has advocated municipal water supply in his annual message to Common Council at annual organization meeting of that body. Water system, as suggested by Mayor, will cost about \$16,000.

**Cohoes, N. Y.**—Council has been asked to employ engineer to prepare plans for high pressure fire system.

**Oneida, N. Y.**—City Engineer J. M. Hutton is preparing plans for proposed extension of Sylvan Beach water system. Extension, which includes purchase of water rights on Vienna Creek and building of pipe line, will cost about \$15,000. New supply will form auxiliary to present system and will furnish sufficient water daily to prevent possible famine.

**Wappinger Falls, N. Y.**—Water system will be installed this year.

**Spencer, N. C.**—Spencer Board of Aldermen is discussing matter of taking over water works system by town. Town is arranging to buy plant of Spencer Water Company at price of \$30,000.

Bonds for purpose have been sold and it is expected plant will be taken over in short time.

**Hubbard, O.**—Drilling of 12-in. well on property of village on which standpipe is located has been decided on by Council.

**Salem, O.**—Installation of water meter system is being discussed.

**Sayre, Okla.**—City Council passed ordinance providing for issuance of \$13,000 water works improvement bonds. Address the Mayor.

**Jackson, Tenn.**—Election has been called for Jan. 12 for voting on bond issue of \$60,000 for improvements to water and light systems.

**Nashville, Tenn.**—Sum of \$15,000 will be appropriated from water works department for purchase of new meters; \$4,500 for repair of buildings at pumping station; \$14,000 for purchase of sulphate of alumina; \$4,000 to rebuild south end of workhouse, and \$40,000 to purchase water pipe and for cost of laying same.

**Beaumont, Tex.**—Election has been called for January 27th to vote \$500,000 water works bonds; \$400,000 to be used in purchase of present plant and \$100,000 for improvements under plans prepared by Burns & McDonnell.

**El Paso, Tex.**—Election will be held February 11 for voting on \$250,000 bond issue for waterworks and sewers.

**Fort Worth, Tex.**—Commissioner Blanke has requested City Commission to approve his plan for repairing waterworks machinery, which provided for estimated expenditure of about \$4,500.

**Salt Lake City, Utah.**—Comprehensive plans of city engineer by which Salt Lake can provide itself with adequate water supply, to meet all demands of population of half a million, at cost of \$1,009,000, and can procure supply adequate for present needs and meet demands of population of 200,000, at cost of \$382,000, have been approved by old City Commission as its last most important act. Recommendation of engineer that steps be taken to put plan into execution without delay has been ordered carried out at once. The central feature of the engineer's recommendations for increasing supply is storage, and his plan provides for this on large scale. Chief among his recommendations is that for gigantic reservoir in Parleys canyon, including dam just below junction of Mountain Dell and main canyon. The completed reservoir is to have capacity of 1,002,809,000 gallons and will cover area of eighty-two acres. The cost is estimated at \$230,000 complete, exclusive of right-of-way. This reservoir will have watershed drainage of thirty-eight square miles. Engineer recommends that dam be built only about one-third or one-half of its height at first and that other units of height be added as more storage capacity is demanded. Engineer also recommends immediate completion of Lakes Phoebe-Mary and Twin lakes reservoirs for storage capacity they will give, and work on the first unit of the Parleys reservoir. The first unit of plan will furnish city with additional storage capacity of 690,000,000 gallons and an additional distribution capacity of 14,600,000 gallons, which are estimated as adequate to take care of needs of present and population of 200,000. Next unit of general plan contemplates completion of giant reservoir in Parleys canyon, second unit of proposed east bench distribution reservoir, a new distribution reservoir known as Spring Valley, additional distribution mains where needed in city, extension of the East Jordan canal to Big Cottonwood to improve the handling of supply and procuring of additional water rights, to provide more supply for increased storage and distribution facilities. It is figured by engineer that with plan he has devised supply can be increased 10,000,000 gallons a day, which is ample to meet all demands. Plan as outlined by engineer will, for cost ultimately of little more than \$1,000,000, give city an increased storage capacity of 1,453,000,000 gallons of water and an added distribution capacity of 91,600,000 gallons, with an increase in supply of 10,000,000 gallons a day. Recommendation for distribution mains is for ten-inch main on Third West, from First North to Ninth North, and a twelve-inch main on Ninth East, from 13th South to 12th South, with others to be added later as needed. Distribution reservoirs are designed to hold enough water to meet all needs for 48 hours, and it is recommended that the east bench reservoir be of 10,000,000 gallons capacity for first unit.

**East Bank, W. Va.**—A \$6,000 bond issue has been voted by citizens of East

Bank, Kanawha County, for water works and sewerage for that place.

**Seattle, Wash.**—Ordinance has been passed which provides for submission to people on March 3 of question of transferring \$250,000 from \$1,000,000 bond issue authorized for acquirement of lands in Cedar River watershed for protection of city's water supply, in order to obtain money to acquire Lake Cushman water power site.

**Watertown, Wis.**—Mayor Breen recommends procuring of service of pure water supply with ultimate idea of conveying water to city mains for public use.

#### CONTRACTS AWARDED.

**Phoenix, Ariz.**—To Martin & Gillis, of Tampa, at \$34,000, contract for building of concrete bases and pressure pipe connections for water wheels.

**Fort Meyer, Fla.**—To Ohio Well Drilling Co., of Jacksonville, contract for drilling an 8-in. well at \$2.45 per ft.

**Bloomington, Ill.**—The Linden st. water main, which will run between Locust and Chestnut sts., has been let to Frank Sullivan for \$410.10. There was one other bidder, I. A. Lederer, who presented figures of \$467.88.

**Richmond, Ind.**—Contract for \$20,000 improvements at water works pumping station have been awarded by Richmond Water Works Company to John F. Hopkins of this city. Improvements include new engine and suction wells for new pump. A \$13,000 pump will be installed as additional improvement. Bids for this pump are being received, according to H. A. Dill, Superintendent.

**Strong City, Kan.**—To Quinn & Zimmerman, city, for construction of reservoir in connection with proposed water works system, to cost about \$20,000.

**Baltimore, Md.**—By city, to Lockjoint Pipe Co., 165 Broadway, New York, at \$225,924.97, to construct service pipe main between Lakes Montebello and Clifton, 5,017 lin. ft. 108-in. and 3,000 lin. ft. 84-in. reinforced concrete pipe, specials, concrete shapes, castings, etc. Ezra B. Whitman is Water Engr.

**Hancock, Md.**—By city, to I. G. Robinson, Hollidaysburg, Pa., at \$15,000 to \$18,000, to construct water works; reservoir 200 ft. in diam., 10 ft. deep and contain 300,000 gals. and about 1 mile of pipes. Alfred M. Quick is Engr., 725-726 Munsey Bldg., Baltimore.

**Omaha, Neb.**—Mayo & Campen have been awarded contract to build foundation of dam near Genoa for Nebraska Power Co. development of Loap River.

**Atlantic City, N. J.**—At adjourned meeting members of Commission officially awarded contract for Arctic ave. water main to Edward L. Bader, the low bidder. His price was \$39,695.20, while Keely-McFeeley Co., which was low bidder, exclusive of operation of time clause, under original award some months ago, put in bid of \$41,393.

**Avalon, N. J.**—To J. W. Corson, of Cape May, for extending water and sewer systems.

**Fargo, N. D.**—To C. H. Porritt, city, for laying of water mains on Ninth st. between Seventh and Eighth aves, at \$1.32 per lin. ft.

**Baltic, O.**—On Dec. 13, bids were opened by Board of Public Service for constructing proposed water works system. As there were many bidders on various parts of work tabulation of bids were not made until recently, work being let as follows: For cast iron pipe, U. S. Cast Iron Co., Pittsburgh, \$3,858.68. There were six other bids, ranging from \$3,908.25 to \$4,145.26. For hydrant, valves, etc., Rensselaer Valve Co., Troy, N. Y., \$642.80. Nine other bids ranging from \$549.16 to \$750. For constructing cement reservoir, Balder & Balder, Baltic, O., \$1,141.03. Six other bids, ranging from \$1,242.70 to \$2,323.35. For laying pipe, Mullet & Getz, New Bedford, O., \$2,149.59. Eight other bids ranged from \$2,312.66 to \$4,604.74. For constructing pumping station, C. A. Haas & Wm. E. Baab, Baltic, O., \$458.89. Three other bids ranged from \$475 to \$1,150. For fuel oil engine and well head, Fairbanks, Morse & Co., Cleveland, O., \$1,366. Work on system will be commenced as early in coming spring as practicable.

**Canal Dover, O.**—By city, contract for construction of standpipe and reservoir, to Chicago Steel & Bridge Works, at \$21,525.

**Franklin, Pa.**—Bid of United States Cast Iron Pipe & Foundry Co., of Pittsburgh has been accepted for the 1,800 ft. of 1-in. water pipe required for new main in Third Ward, which will be laid down when new streets there are finally

opened. Bid, lowest of several, was \$22 per ton.

**Columbia, S. C.**—For water and sewer improvements as follows: Hauling and laying, etc., awarded to J. C. Fahey, of Orangeburg, as follows: 8,844 lin. ft. 6-in. water main, 18 cts.; 5,424 lin. ft. 8-in., 25 cts.; 3,552 lin. ft. 12-in., 31 cts.; 21 fire hydrants, to set, each, \$5; 51 valves and boxes, to set, each \$3; 2,478 lin. ft. 15-in. vitr. sewer pipe, to lay, 54 cts.; 3,174 lin. ft. 10 in., 42 cts.; 7,817 lin. ft. 8-in., 26 cts.; 16,500 lin. ft. 6-in., 18 cts.; 28 man-holes, each, \$35; 2 flush tanks, each, \$38; 400 lin. ft. 16-in. c. i. sewer main, to lay, 70 cts.; total, \$13,317. Totals of other bids: C. B. Mendenhall, Charlotte, N. C., \$17,652; M. P. Flynn, Chattanooga, Tenn., \$20,281; Jacobs-Gribble Contr. Co., Durham, N. C., \$16,521; Isaac C. Mishler, Chattanooga, Tenn., \$20,596; Porter & Boyd, Charlotte, N. C., \$17,077; Weston & Brooker, Columbia, S. C., \$23,547; Farmer, Simon & Co., Wilmington, N. C., \$20,489; Berry-Fortune Co., Augusta, Ga., \$27,896. For 478 tons c. i. pipe and 8 tons fittings to U. S. Cast Iron Pipe & Fdy. Co., Chattanooga, Tenn., at \$10,583. For 30,000 lin. ft. vitr. sewer pipe, 6 to 15-in., to Columbia Supply Co., of Columbia, at 6 cts. to 25 cts. per ft.; total, \$3,001. Valves and hydrants to R. D. Dood & Co., of Philadelphia, Pa., at \$1.150. John McNeill, City Engr.

**Richmond, Va.**—For (a) constructing about 3½ miles of water mains and (b) furnishing pipe, at Richmond College, to (a) Alvin Maynard, Richmond; (b) Glamorgan Pipe & Foundry Co., Lynchburg, Va.

**Seattle, Wash.**—By Board of Public Works, for construction of water mains in Queen Anne Blvd., to Fred Carlson, at \$1,463.40.

#### LIGHTING AND POWER

**Phoenix City, Ala.**—Mayor Harrison recommends erection and operation of municipal light and power plant.

**Pasadena, Cal.**—Commissioner Allin has been approached by people interested in extending ornamental light district over section which would about double present mileage of thoroughfares thus illuminated. These people are planning to have ornamental lights placed on N. Fair Oaks, N. Raymond and N. Marengo aves. Plan is to run light systems north on these three long avenues from place cluster system now terminates, possibly to north city limits and certainly to Washington st. If extended to north city limits new lines would add nearly seven miles to ornamental post illumination mileage of city, to be exact, 36,000 ft. General Manager Koerner of municipal light works will figure out cost of such system, at request of Commissioner Allin.

**Quincy, Ill.**—Corporation Counsel Bennett has submitted set of specifications under which bids are to be asked for lighting of streets of city for periods of one, two and three years. Bids will be received Feb. 2.

**Goshen, Ind.**—City of Goshen has just arranged for \$35,000 temporary loan to pay expense of reconstructing of municipal lighting plant.

**Minden, Ia.**—People have voted \$7,000 in bonds for erection of electric light and power plant.

**Atehlson, Kan.**—A new white way petition, covering territory on Commercial St., from Fifth to Ninth, has been presented to Council and referred to city attorney for investigation. It will come up for consideration at next Council meeting.

**Lawrence, Kan.**—"Great White Way" is to be installed. It is understood that committee will recommend adoption of one of three propositions to be submitted by this special committee. Proposition No. 1 provides for use of trolley poles, brackets being attached at proper height. This is plan of some sample lights which have been installed on Massachusetts st. and which have been in operation for some time. Second proposition is for installing of special poles with overhead wires as is case in the "midget" white way which Lawrence has had in the past. Proposition No. 3, and one favored by committee, class of special poles, also new concrete curb and gutter along Massachusetts st. containing a conduit for wires, giving underground wiring system for white way.

**Baltimore, Md.**—Through efforts of Councilman W. W. Stockham, Superintendent of Lamps and Lighting McCuen has decided to install adequate lighting system on Harford road, from North ave. to city limits, and additional lights on North ave. from Greenmount to Baltimore Cemetery.

**South Hadley Falls, Mass.**—Municipal lighting system is being considered.

**East Orange, N. J.**—Better lighting on Park Ave. is being planned.

**Elizabeth, N. J.**—Street Lighting Committee has been authorized to seek bids for lighting city's streets for periods of one, two, three, four and five years. Contracts with Public Service Electric Co. and Elizabethtown Gas Co. expire March 15.

**Passaic, N. J.**—If present plans are carried out, Board of Commissioners will accept five-year contract of Public Service Corporation and money saved will be used to meet cost of lighting Main Ave. more efficiently.

**Trenton, N. J.**—Board of Trade of Saddle River Township will furnish bond guaranteeing partial reimbursement to Public Service Gas Co. for its outlay, Board of Public Utility Commissioners will order company to extend its mains to include Dundee section of township. It is estimated that outlay on new mains, meters and service would cost \$10,143, and that plant investment represented would be approximately \$3,000.

**Niagara Falls, N. Y.**—Board of Public Works will extend decorative lighting system in Third St., from Falls to Main St., and in Main St., from Pine to Michigan Ave., and has directed city electrician and city engineer to prepare estimates on cost of installation for presentation first meeting in February. Estimates for systems in First and Second St., from Jefferson Ave. to Niagara St., will also be presented, property owners having petitioned for decorative systems. Board also voted to take over Third St. lighting system installed by merchants and which has been maintained jointly by them and city. Plan is to install double inverted arc lamps, such as are now in Falls and North Main Sts., to replace present Third St. lamps.

**Poughkeepsie, N. Y.**—Plans are being considered for municipal electric plant. Estimated cost \$5,000.

**Tonawanda, N. Y.**—City Council is considering installation of new street lighting system in business section.

**Youngstown, O.**—Mayor Hartenstein urges that Council co-operate in securing an improved street lighting system at once, examine into advisability of establishing municipal electric light and power plant in connection with Milton reservoir, etc.

**Afton, Okla.**—City is said to be considering plans to furnish Fairland with electricity from municipal electric light plant. It is proposed to construct 16,000-volt transmission line to Fairland costing \$5,000, to be paid by Fairland.

**CConnellsville, Pa.**—Plans are being discussed for installation of "Great White Way" on Main and Pittsburgh sts.

**Woonsocket, R. I.**—Board of Aldermen has passed several resolutions authorizing installation of various incandescent street lights.

**Staunton, Va.**—City will erect new lighting plant for its street electric lighting system, to cost about \$40,000.

**Tacoma, Wash.**—City Council has authorized installation of luminous-arc lamps in business district. Estimated cost, \$36,000.

**St. Thomas, Ont.**—City Council is discussing installation of ornamental street lighting system on principal streets of city.

#### CONTRACTS AWARDED.

**Johnston, R. I.**—At special meeting of Johnston Town Council contract was made with Narragansett Electric Lighting Co. for lighting town highways with incandescent lamps, which will replace all of arc lights which have been in service many years. Company will install about 200 incandescent lamps, and contract, which will run for ten years, sets price at \$17 per year for each lamp.

**Corpus Christi, Tex.**—Contract has been closed between City Council and Corpus Christi Ice & Electric Co. whereby that concern will install complete street lighting system throughout entire city. Work will begin at early date.

#### FIRE EQUIPMENT

**Tucson, Ariz.**—Mayor Hoffman recommends installation of auto fire apparatus.

**San Francisco, Cal.**—Plans for new Fire Department house at corner of Drumm and Commercial sts. have been approved by Board of Works and contracts will shortly be let.

**Stockton, Cal.**—Residents in northwestern part of city have filed petition with the City Council asking that fire house be installed in that district.